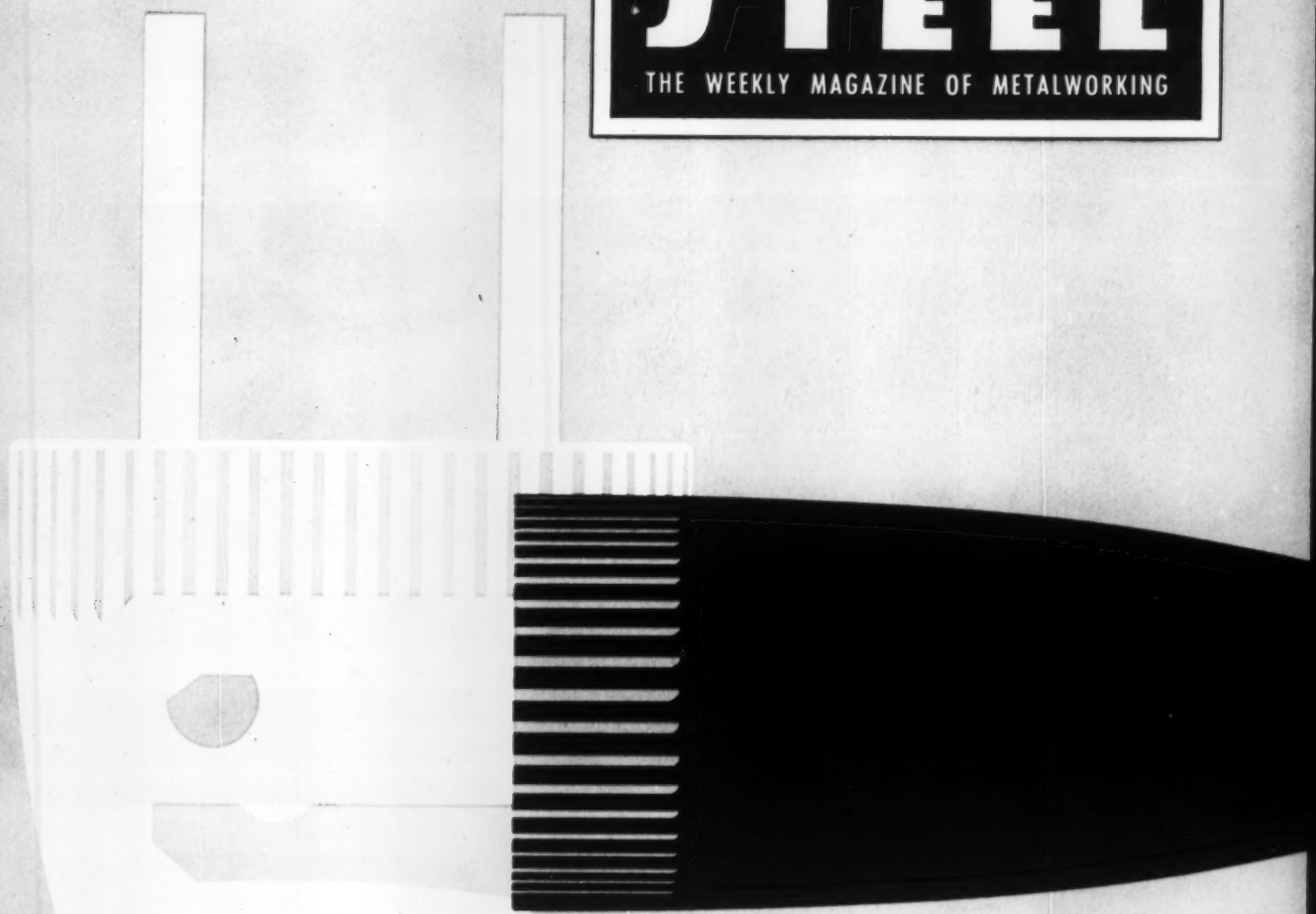
DECEMBER 20, 1954

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



APPLIANCES

10 per cent better sales in '55

—page 41

✔ **PROMOTING GRAY IRON**
Foundrymen Look Ahead, p. 44

✔ **INDUSTRIAL TELEVISION**
An Extra Eye on Profit, p. 74

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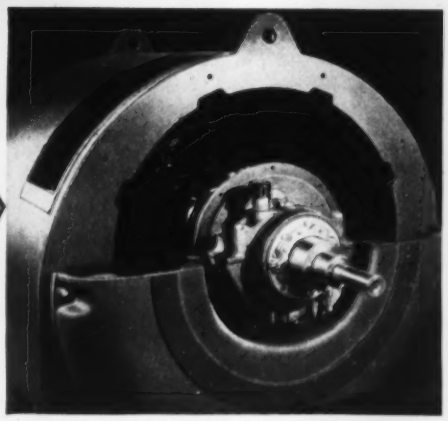
new DESIGN...

more protection with full accessibility



* New Allis-Chalmers slip-ring motor with inspection cover and upper half of end shield removed. Note accessibility of brushes, protection of bearing.

ALLIS-CHALMERS LARGE SIZE SYNCHRONOUS AND WOUND-ROTOR MOTORS have been completely redesigned with longer stator yokes and shorter end shields. Collectors and brushes are located inside the yoke for protection against physical damage, dripping moisture, dust and dirt.

Capsule-type bearings give better bearing protection, too. The upper half of the end shield may be removed for inspection or cleaning of the interior of the motor without disturbing the exciter or exposing the bearing to the ravages of dirt, dust and oil contamination.

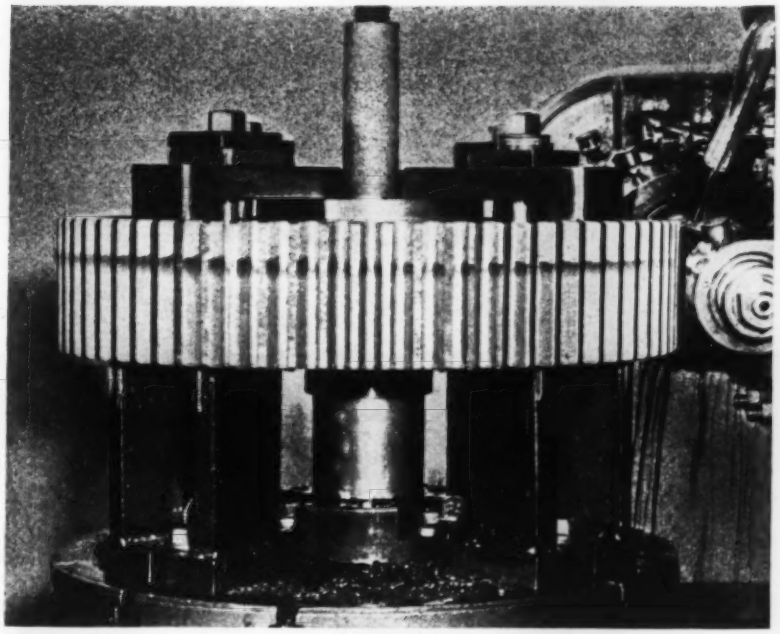
All leads enclosed — Both primary and secondary winding leads are brought out through separate conduit boxes. There is no loose wiring . . . no exposed leads anywhere.

Easy maintenance — Even though the new design offers maximum protection to brushes and collectors, internal parts are fully accessible for inspection and maintenance through large openings in the stator yoke. Opening covers are readily removed and are secured during operation by easy-operating, self-locking fasteners.

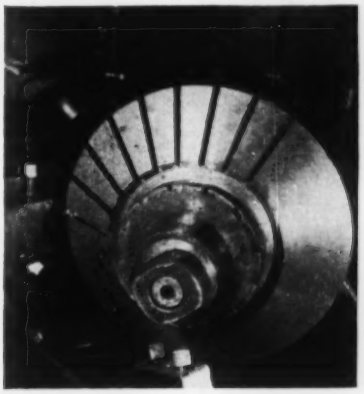
Get details now — This new design is available from approximately 250 hp at 300 rpm and up, in drip-proof and splash-proof construction. Call your Allis-Chalmers representative for complete details or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 05R8183.

A-4464

ALLIS-CHALMERS



Machining an axle gear at the plant of Goodman Manufacturing Co., Chicago. Widely known for its mining equipment, Goodman is a regular user of Bethlehem gear blanks.



▲ Many firms make strong bevel and miter gears from Bethlehem blanks.

How to make a STRONG Gear and still keep its weight down

Goodman shop craftsman tests a finished gear with master pinion.

Often the first problem in gear design is to achieve high strength with a minimum of weight. Bethlehem supplies an answer to this common problem with its forged-and-rolled gear blanks, which are available in sizes from 10 to 42 in. OD.

Forged-and-rolled means just what it says. The blanks are processed in a unique mill that combines the steps of forging and rolling, with the attendant benefits of both. Each blank has the density and compact internal structure of forged metal, plus the smooth grain flow of a rolled product. The end result is strength—high load-bearing strength. Thus users frequently find it possible to employ thinner, lighter sections than they formerly specified, and still meet every requirement.

Also, because of their good grain flow, uniform density, and clean, homogeneous metal, the blanks are very easy to machine. Cutting speeds are frequently higher, and finish-machining can often be accomplished with fewer cuts.

If you manufacture spur, bevel, miter, herringbone, or other types of gears, Bethlehem's forged-and-rolled blanks can lead to important economies. Please remember, too, that they are excellent for sheave wheels, industrial wheels, turbine rotors, clutch drums, tire molds, and numerous other circular steel products.

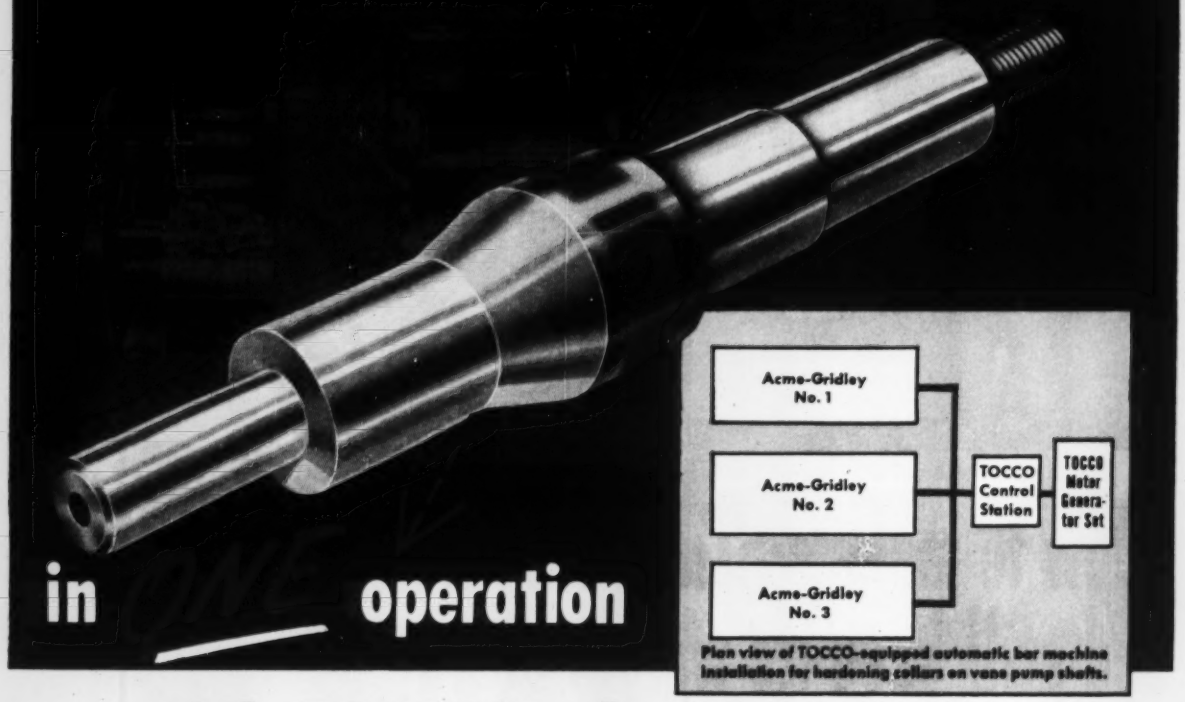
Many details—and almost 100 pictures—are to be found in Booklet 216, which is yours for the asking. Write today for a free copy, addressing request to Bethlehem Steel Company, Publications Dept., Room 1037-A.

BETHLEHEM
Forged-and-Rolled
CIRCULAR FORGINGS

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Pump Shafts Machined and Hardened



Plan view of TOCCO-equipped automatic bar machine installation for hardening collars on vane pump shafts.

with TOCCO* Induction Heating

TOCCO-equipped 8-spindle Acme-Gridley Bar Automatics at a large automotive manufacturer's plant produce vane pump shafts for power steering units in one completely automatic operation!* No handling—no hardening cost except power!

A TOCCO inductor, mounted at one station of each automatic, hardens collars on pump shafts after they have been completely machined at preceding stations on the same machine. Each installation consists of 3 automatic machines equipped with inductor coils powered by a 50 KW, 10,000 cycle TOCCO unit. Production from each installation is 360 shafts per hour.

Shafts are made of C 1144 and only the collar is hardened to prevent scoring the seal. TOCCO's rapid heating confines the hardened area to the surface of the collar leaving the rest of the shaft unaffected.

If your products or their components require heat treating, soldering, brazing or heating for forging, it will pay you to investigate TOCCO for better, faster production at lower unit costs.

A Patented Process

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-12, Cleveland 1, Ohio
Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating."

Name_____
Position_____
Company_____
Address_____
City_____ Zone____ State____

Traveloader replaces 3 trucks and releases 6 men for other work

● A Traveloader is used by Kyle-Taylor Lumber Company, Berwick, La., to transport pipe from river dock to storage. It has replaced two pipe trailers and a gin-pole truck formerly used on this job, reduced man-power required from 15 to 9 and made time savings of about 70%.

This company, serving oil producers, receives pipe in barges at the river dock. A truck crane unloads and places the pipe on the dock. The Traveloader picks it up five lengths at a time, transports it to the storage yard, and stacks it neatly on racks for further disposition.

Time studies reveal the speed with which Traveloader works. Loading time at dock averages 35 seconds. Hauling to storage, stacking and returning to dock (round trip .55 miles) averages 3 minutes 8 seconds. The stacking part of this operation takes only 24 seconds! As a result the crane at the dock never has to wait for the Traveloader.

Since the company operates 24 hours, 7 days per week, the cost savings are substantial. Moreover, 6 more workers were made available without increasing payroll, and two less mechanized units require maintenance. "This machine is by far the finest that I have seen for handling pipe. It has doubled our capacity with less labor," says Mr. J. E. Kyle, Jr., Vice President.

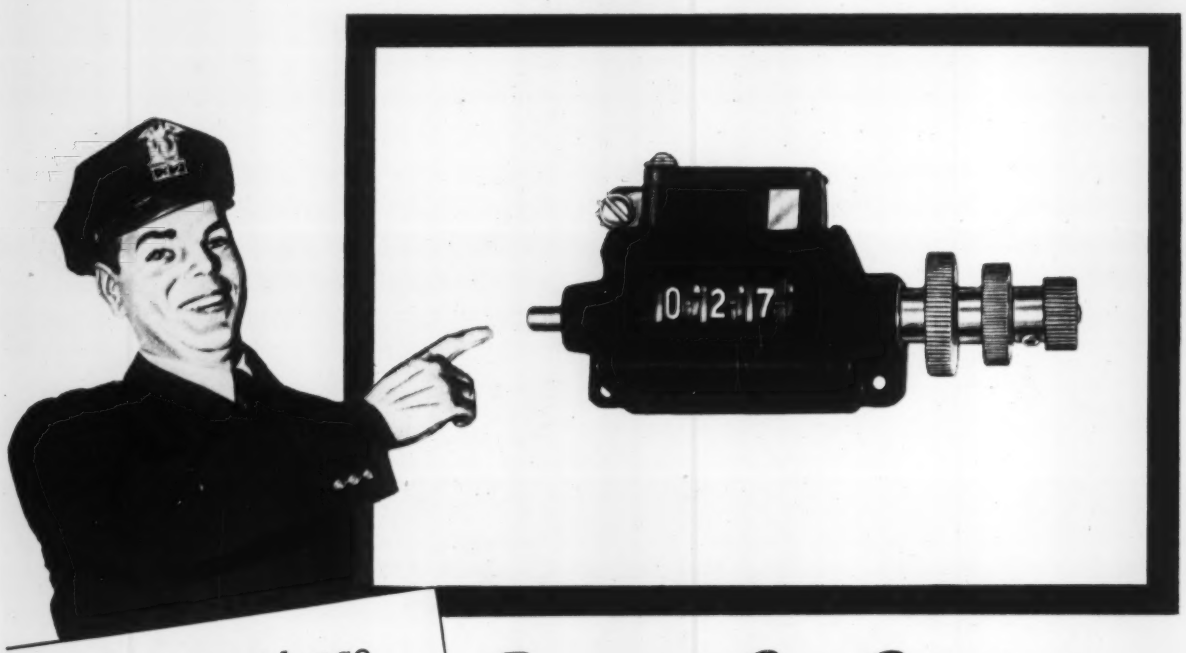
Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck. The Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

Here's a New

"TRAFFIC COP"

for short high-speed runs



Added Evidence that—

Everyone Can Count on VEEDER-ROOT

This new small Predetermining Ratchet Counter is set for any run up to 1,000 counts, pieces or other units by the three knurled setting knobs. Then it subtracts to zero, and at that point actuates a contact to light a light, ring a bell or stop the machine. Compact and easy to reset, this counter makes an attractive new selling feature when built into a machine as a standard integral part. And it's just one of scores of standard and special Veeder-Root Counters for every mechanical and electrical application in any field from atomics to automation. What would *you* like to count? Let Veeder-Root figure out how to do it. Write:

VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
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® **"The Name that Counts"**

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 25 December 20, 1954

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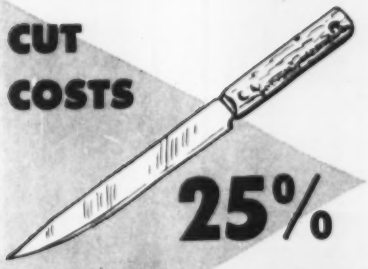
CUT COSTS



25% with NEW Luster-On® COBRA C

COBRA C is the *new* chromate finish for high corrosion protection and bright finish on copper, brass or bronze. Can be used on solid or plated copper or brass; for cleaning and deoxidizing copper or brass parts; for removing flux on soldered parts.

Just *one* advantage of Luster-On COBRA C is that it can be diluted . . . cutting costs for you up to 25% over regular COBRA.

COBRA C eliminates hazardous nitrous oxide fumes that most bright brass treatments give.

COBRA C can be used at room temperatures or slightly elevated.

And, IN ADDITION, COBRA C

- Produces a permanent lustrous finish even in recessed areas.
- Stands over 100 hours standard salt spray; assures long life.
- Can be handled immediately after treatment cycle — no staining or finger marks.
- Replenishment possible with same concentrate.
- Exhaust of bath in use is optional — not required.
- Excellent paint bond qualities.

LUSTER-ON® — the first in the field and still the leader.

Write for full data sheets, and send a part for free processing. L-14

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FINISHED STEEL
BARS—TUBES—STRIP

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behind the scenes

Yearbook Looms

Two weeks from today the copy of STEEL that falls on your desk will fall with a much more resounding thump because it will weigh about three times as much as the one you are holding now. STEEL's Metalworking Yearbook, scheduled for Jan. 3, 1955, will weigh about 3 lbs. It will initiate STEEL's 1955 campaign to help guide the metalworking industry through the complexities of another year.

The Yearbook will be consulted eagerly by corporation officials, general managers, department heads, engineers, supervisors and purchasing agents. Eagerly, did we say? Greedily would be a better word, but scarcely a diplomatic selection, even if our distinguished readers ARE greedy for business information. We won't take up your time with a recitation of Yearbook data—you know, calculations concerning the distance our readers would stretch if placed end to end, and estimates of the accumulated energy our editors have applied to their typewriter keys, and similar staggering phenomena. We can however, leave you with this thought: Max D. Howell, executive V. P. of the American Iron & Steel Institute, said, "The country is catching its breath for a new economic advance." While it is in the process of catching its breath, executives of the metalworking segment will relax with over 40,000 copies of the Yearbook —more than 120,000 lbs. of information on business, employment, costs, expansion, new products, competition and prospects for 1955.

Nothing False Here

"We in the Small Business Administration regard the matter of education in the problems of business of prime importance," began Wendell B. Barnes, Small Business Administrator, in an address recently delivered before the Eastern Brass & Copper Co. in New York. Mr. Barnes illustrated his remarks with anecdotes derived from actual correspondence, and although the Readers Digest for December beat us to the punch on this item, we'll print it, anyway. It suggests the extraordinary lengths to which a manufacturer will go to keep abreast of competition.

"Not long ago," said Mr. Barnes, "we received a letter from a man who is president of a company manufacturing brassieres. This gentleman had heard that the Small Business Administration had published a pamphlet on 'Packaging Pointers', and he would like to have some for his business."

We are too frightened to comment on this; we only hope the pamphlets were delivered in time to keep the company from going bust.

What Price Wire?

W. B. Hays last month hovered over his typewriter in the office of Tyler & Simpson Co., wholesale grocers out in Paul's Valley, Oklahoma, and addressed himself to STEEL. "It would be invaluable," he wrote, "if you could arrange to include in your weekly price quotations Automatic Baler Wire." He concluded by suggesting that hundreds of steel distributors and warehouses would incline along with him in finding the information invaluable, and he dispatched the letter with kindest regards.

The letter was turned over to Market Editor Bill Rooney, who suddenly found himself up a tree. The soul of courtesy and kindness, Bill was placed in the embarrassing position of being obliged to answer a polite request with a suggestion that space limitations made it impossible for him to publish prices on Automatic Baler Wire. However, he promised to look into the matter, and that's how things stand now.

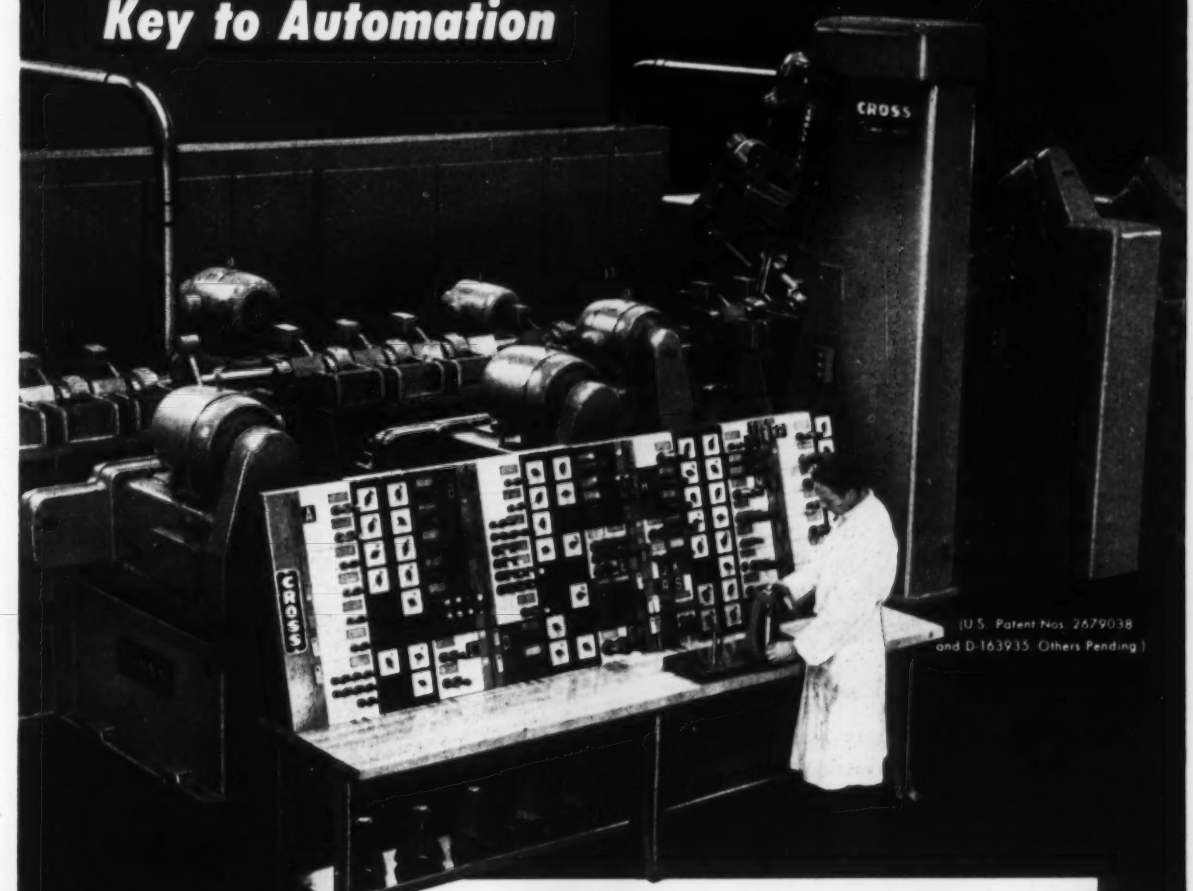
"An Oklahoma grocery store!" Bill whispered, gazing absently at the letter. "Is there no end to the variety of business establishments STEEL gets into?" Suddenly a grin crossed his honest Irish countenance. "Why, it's as plain as a pikestaff," he cried, coining an expression on the spot. "Why, the groceryman mistook me for another kind of Market Editor!"

Shrdlu

(Metalworking Outlook—Page 33)

Cross Machine Control Unit— Key to Automation

A Mechanical Eye to Watch Your Tools



(U.S. Patent Nos. 2679038 and D-163935. Others Pending.)

The greatly increased number of tools used in modern transfer-type machines makes adequate tool control a "must." The Cross Machine Control Unit was developed to meet this need—to cut downtime by programming tool changes . . . to reduce tool expense.

The Cross Machine Control Unit is equipped with Toolometers which furnish a visual record of used and unused tool life and *automatically stop the machine when tools need changing*. Other tools almost used up are replaced at the same time. This grouping of changes, plus the availability of pre-set tools which are stored in the Machine Control Unit, reduces downtime. And downtime for machine adjustments and trial cuts is eliminated because standard fixtures and gages are provided for pre-setting the tools.

Over 300 Cross Machine Control Units now in use are evidence of cost saving benefits. Get full information today.

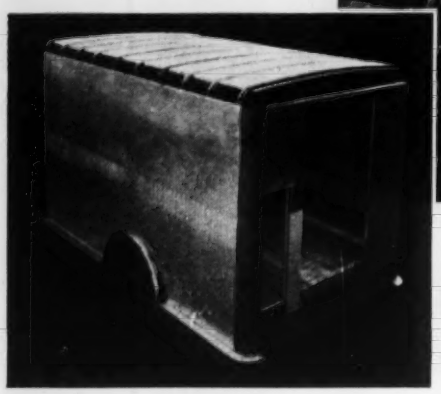
Established 1898

THE CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

Panels and roof for this Nabisco truck body were fabricated from Electro Paintlok by McCabe-Powers Auto Body Co., St. Louis, Mo.



IF YOU PAINT ON STEEL

this may deliver an idea to you

For National Biscuit Company, customer attraction starts on the street. Therefore, lasting paint adherence, long service life and attractive appearance are extremely important on Nabisco delivery trucks.

To obtain these results, even under extreme weather conditions and hard service, Electro Paintlok is used for Nabisco truck bodies.

Electro Paintlok is the zinc plated steel sheet that is chemically treated to take paints, lacquers, synthetic enamels—and hold them for years.

And, even though the painted surface should become scratched, the tight zinc coating guards against underfilm corrosion and creeping rust.

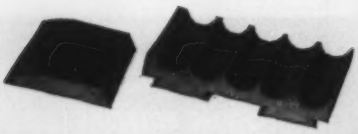
Republic Electro Paintlok is easy to fabricate, too. The tight zinc coating will not crack, peel or flake during normal fabricating operations. Surfaces require no pre-etching. They are preconditioned for painting.

Get the full story on Republic Electro Paintlok for your fabricated steel products that need to look better longer. Write:

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, N.Y.

REPUBLIC
ELECTRO ZINC PLATED SHEETS
ELECTRO PAINTLOK • ELECTRO ZINCBOND

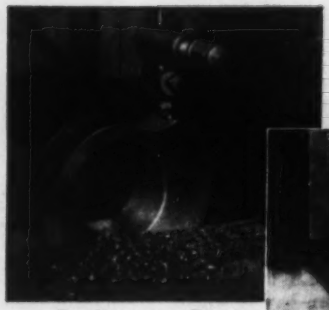
Other Republic Products include Carbon, Alloy and Stainless Steels — Sheets, Strip, Bars, Pipe, Tubing, Bolts and Nuts, Wire, Pig Iron



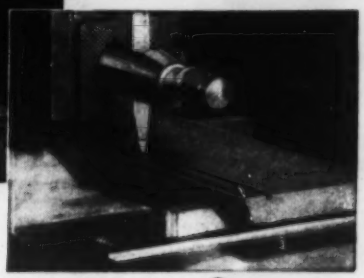
Form Tools

Dies from Templates

Facing 90° shoulders



Duplicating a Cam



Interchangeable molds

Automatic duplicating of MANY shapes on a Cincinnati Shaper...

Many diversified parts are accurately reproduced at low costs by automatic duplicating on Cincinnati Shapers.

Single point tools—simple low cost sheet metal templates, or the part itself are used to duplicate the piece.

The Shaper is instantly reconverted to standard use when desired.

Automatic duplicating can save you money and time in your shop.

Write for Bulletin N-6.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

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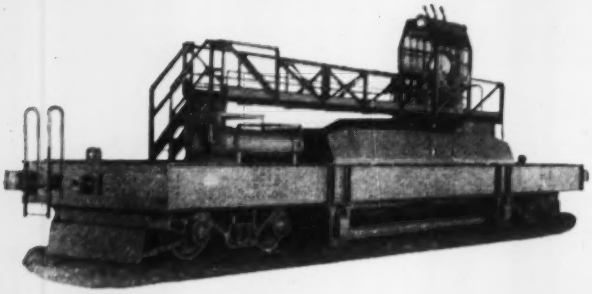
Time has proved . . .

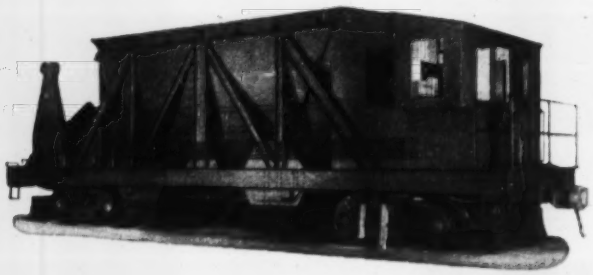
ATLAS

Builds Dependable Equipment



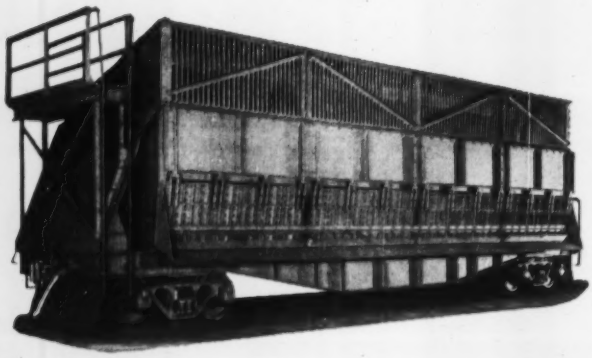
30 Ton Double Hopper Bottom Scale Charging Car. Operator's platform is above hopper to facilitate bin operation.

SCALE CARS



60 Ton Center Bottom Dump Ore Transfer Car. Equipped with pneumatically operated balanced type pusher arm.

ORE TRANSFERS



Coke Quenching Car. Motor-operated cast steel discharge gates. Bottom, ends and front are abrasive resistant steel plate.

COKE QUENCHERS

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS TO THE EDITORS

Low Down on Wrought Iron

I am interested in wrought iron products, particularly wrought iron home furnishings. Specifically, I am interested in how wrought iron is shaped, welded and finished. Any information you can furnish me will be greatly appreciated.

Louis Demeo
61 Arnold St.
Providence, R. I.

• *Much of the furniture and other home furnishings advertised as "wrought iron" are actually made of low carbon steel. Cost of wrought iron is higher, so that metal is used when the manufacturer wants special corrosion-resistance and resistance to fatigue failure.*

A. M. Byers Co., Pittsburgh, producer of most American wrought iron, says the metal can be shaped by common methods and welded by any commonly-used process, such as forge welding, electric resistance welding or gas welding. Wrought iron can be finished and painted by the same methods and paints used for other ferrous metals.

Two Byers Co. publications especially helpful are one dealing with welding the metal and the other, a book titled, "Wrought Iron." The book may be purchased for $1 from Frank Farnan, advertising manager, A. M. Byers Co., Clark Bldg., Pittsburgh 22.—ED.

Another Peek at 'Windows'

In STEEL for Nov. 15, p. 92, the "Windows of Washington" column was entitled, "Did Union Dollars Pay Off at the Polls?" If tear sheets of this article are available, we would like to get three for our files.

C. K. Scott
Chamber of Commerce of the U. S.
Washington

• *Sent.—ED.*

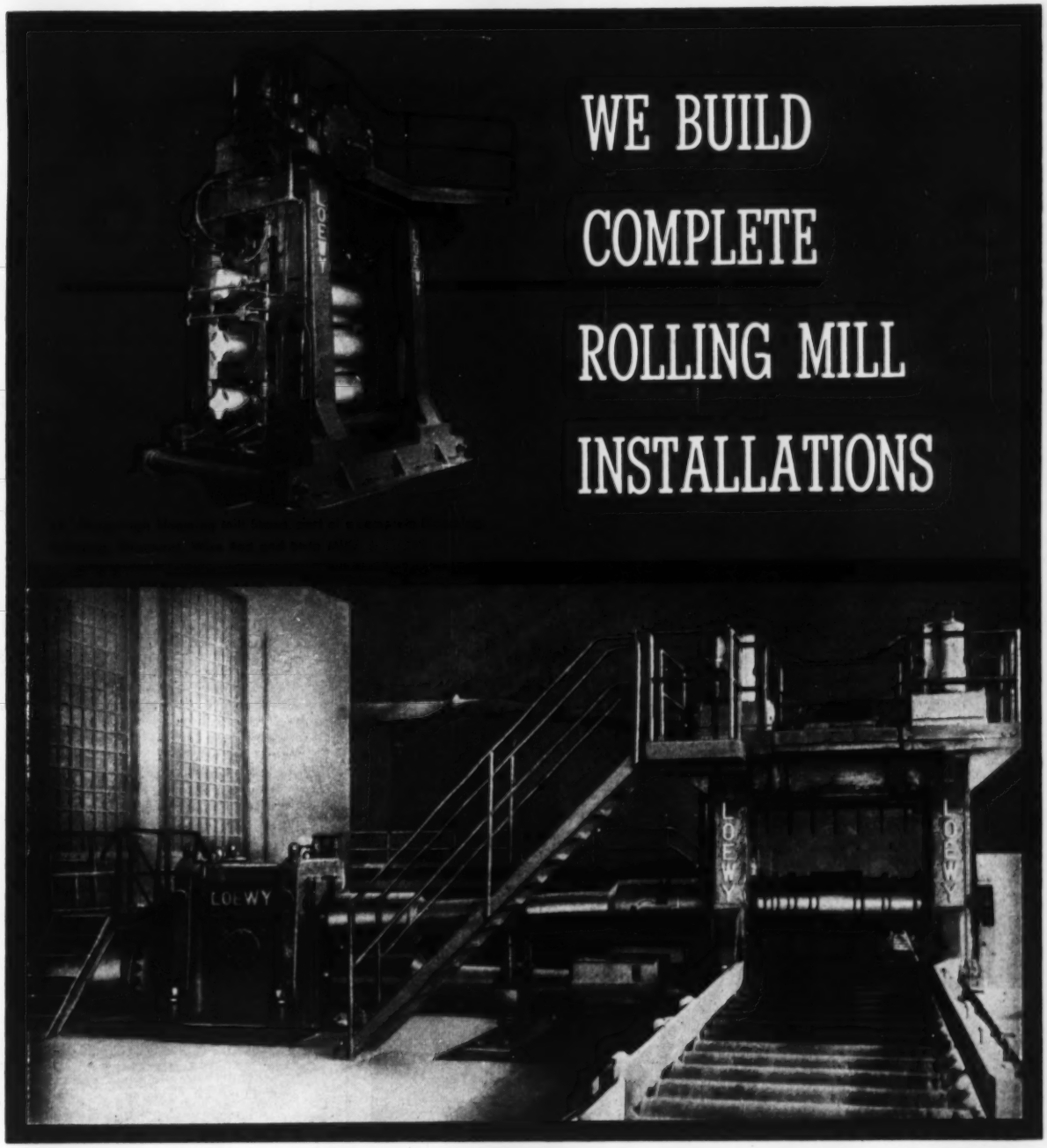
Galvanizing Information Wanted

We understand that there was an article in STEEL on the tonnage of galvanized sheets produced by the continuous lines versus the batch method. Would you please give us these statistics?

Ernest W. Horvick
American Zinc Institute Inc.
New York

• *In the Mar. 29 issue, p. 149, we carried the story, "Continuous Galvanizing: New Lines of Business." At that time, 9 of 17 makers of galvanized sheets had continuous lines. Several additional*

(Please turn to page 12)



26" Two-high Blooming Mill, part of a complete Blooming, Slabbing, Structural and Strip Mill Installation.

THREE-HIGH OR TWO-HIGH BLOOMING MILLS
CONTINUOUS STRIP MILLS • SPECIAL MILLS
CONTINUOUS MERCHANT AND WIRE-ROD MILLS
MERCHANT MILLS • RAIL AND STRUCTURAL MILLS
CONTINUOUS BILLET AND SHEET-BAR MILLS
SKELP ROLLING MILLS • HIGH SPEED FOIL MILLS
HIGH SPEED COLD ROLLING SHEET AND STRIP MILLS

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ENGINEERS • CONTRACTORS
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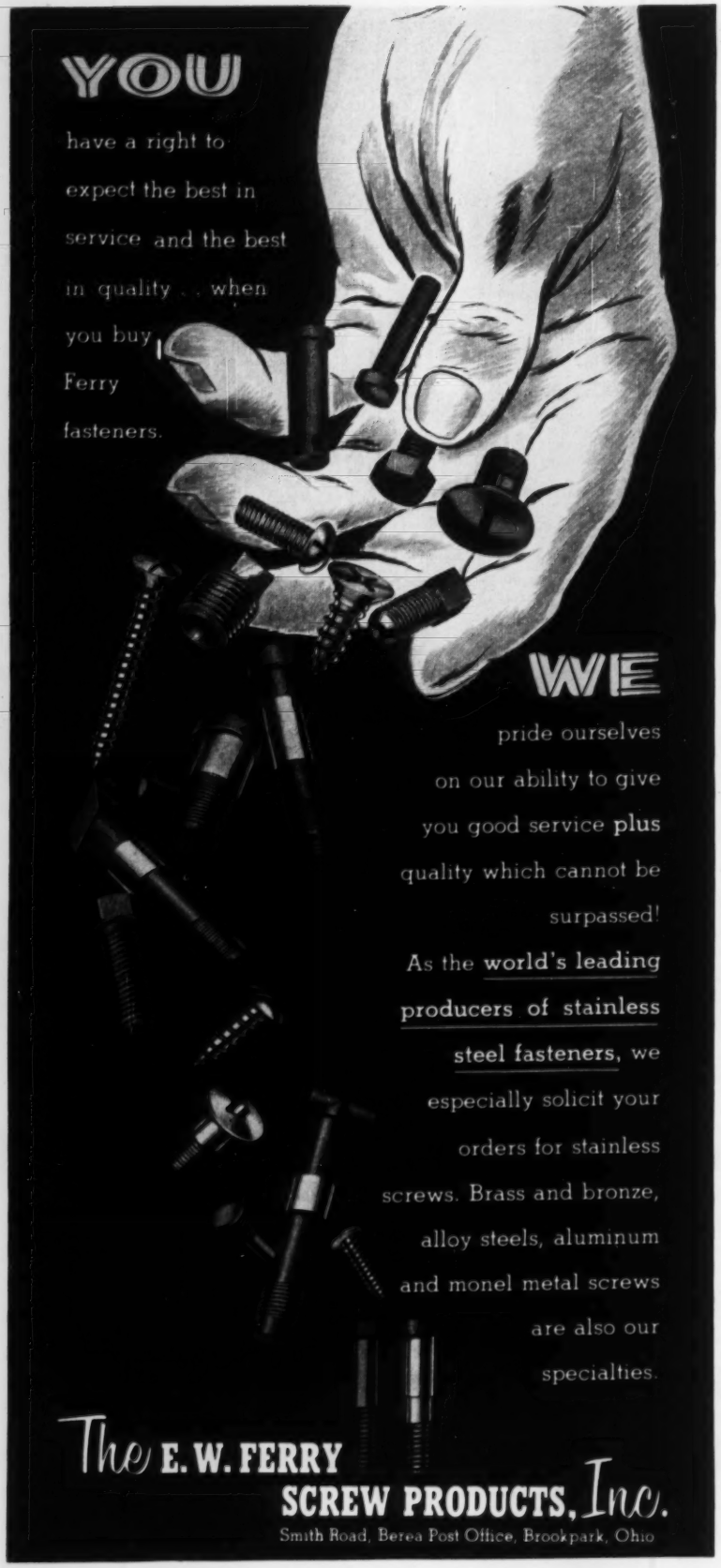
Rolling Mills • Hydraulic Presses • Pipe Testing Machines • Special Pipe Mill Equipment • Accumulators • Pumps


YOU
have a right to expect the best in service and the best in quality . . when you buy Ferry fasteners.
WE
pride ourselves on our ability to give you good service plus quality which cannot be surpassed!
As the world's leading producers of stainless steel fasteners, we especially solicit your orders for stainless screws. Brass and bronze, alloy steels, aluminum and monel metal screws are also our specialties.
The E. W. FERRY SCREW PRODUCTS, Inc.
Smith Road, Berea Post Office, Brookpark, Ohio

LETTERS

(Concluded from page 10)

lines were under construction and others were being considered.

In that story we quote E. F. Lundeen, assistant superintendent, quality control department, Inland Steel Co., as saying: "With completion of new units the industry will have an annual capacity of well over 1 million tons a year in continuous galvanized sheets." The story also says other estimates place continuous capacity slightly over 50 per cent of total galvanizing capacity. On Jan. 1, 1954, the steel industry had an annual capacity of 3,311,620 net tons of galvanized sheets. Slightly over half that amount would put continuous capacity at about 1.7 million tons.—ED.

Galvanizing Articles Wanted

Since we apparently missed the original articles appearing in previous issues, we would like to receive a tear sheet of each of the following stories: "Modern Practice of Hot Dip Galvanizing" (Feb. 22, Mar. 1 and Mar. 8); "Continuous Galvanizing Line" (Apr. 5 and Apr. 12); and "How To Avoid Galvanizing Embrittlement" (Nov. 22).

G. R. Wineholt
La Porte Division
Coleman Co. Inc.
La Porte, Ind.

We would appreciate your forwarding us tear sheets of the three articles . . .

William G. Goddard
Arabian American Oil Co.
New York

We did miss these articles and would be pleased if you would send us tear sheets of same . . .

J. S. Case
vice president charge of engineering and production
Anchor Post Fence Division
Anchor Post Products Inc.
Baltimore

Shape of Good Design

May we ask you to send us a tear sheet of the article, "Profit Is the Real Yardstick of Design" (Nov. 22, p. 81), No. 10 in STEEL's Program for Management.

W. Kauders
Hydropress Inc.
New York

It will be appreciated if you will send a set of tear sheets . . .

E. Zell
Norden Laboratories Corp.
White Plains, N. Y.

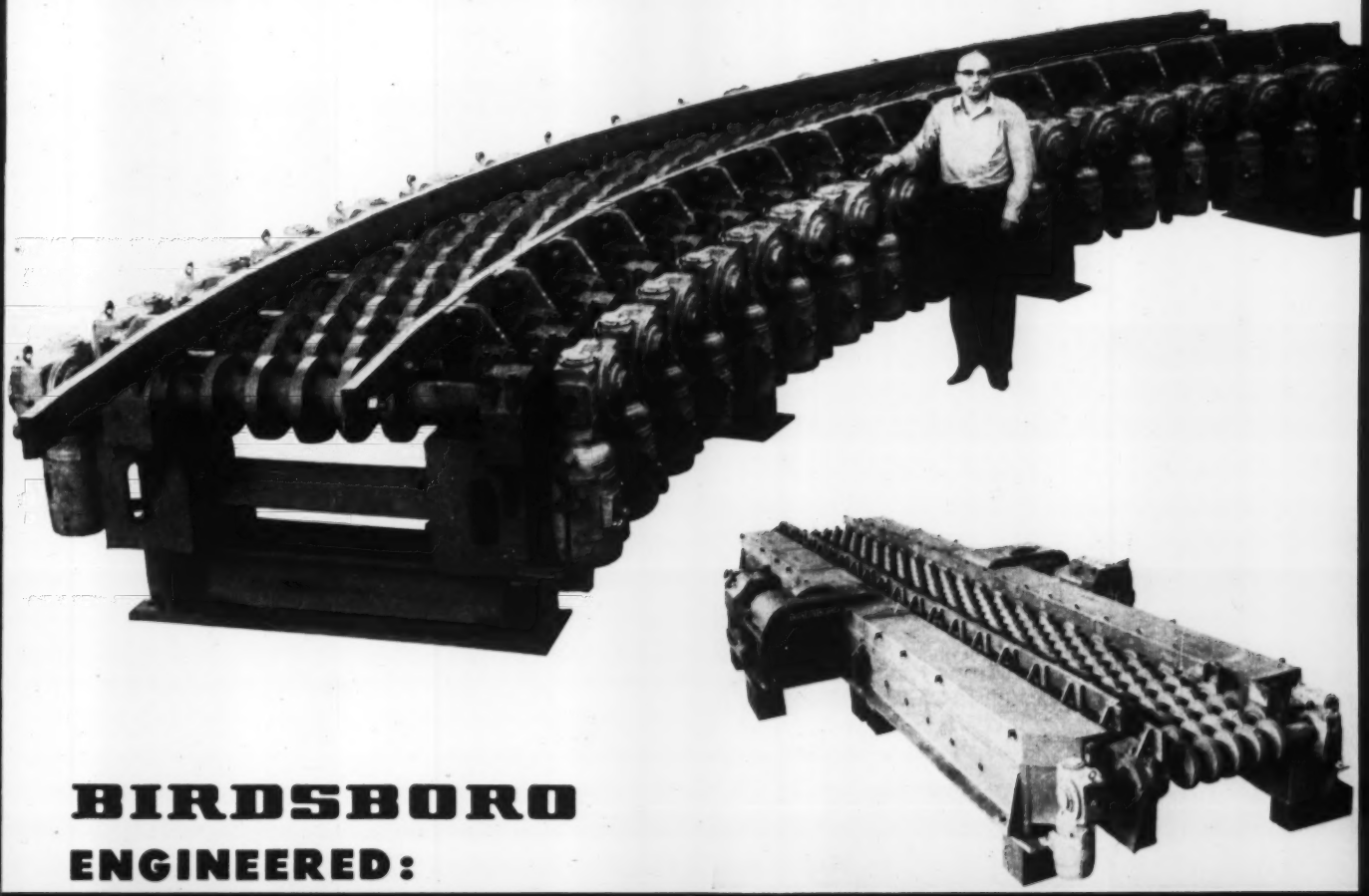
Choosing Materials

Kindly send us a tear sheet of the article, "Choice of Material Is Vital" (Nov. 15, p. 158).

J. E. Gable
New Holland Machine Division
Sperry Corp.
New Holland, Pa.

• *Sent.—ED.*

Plate mill auxiliaries...



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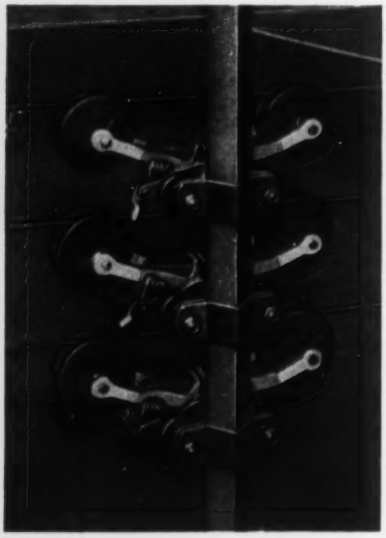

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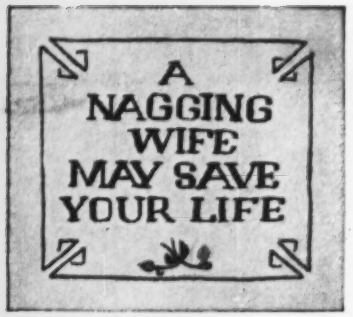

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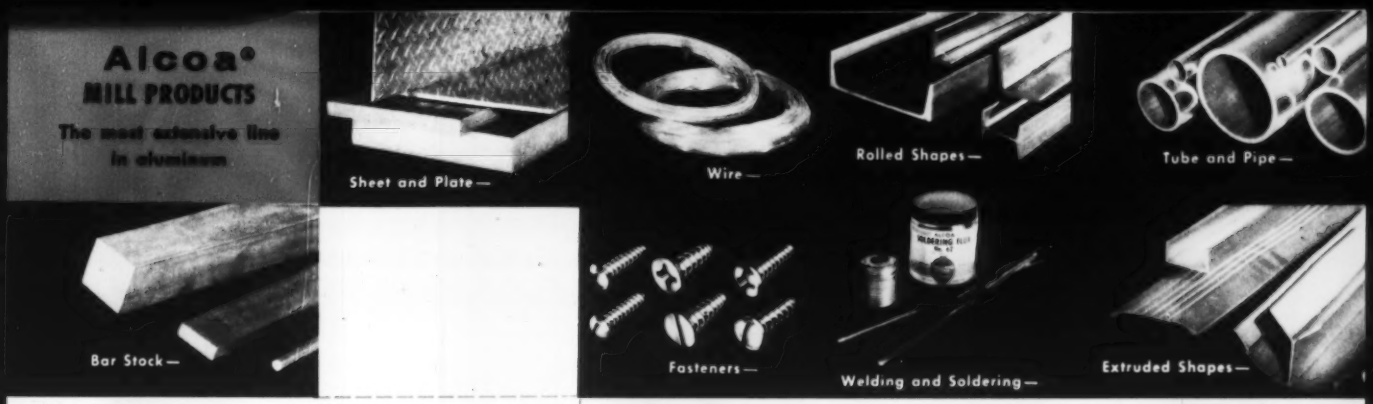

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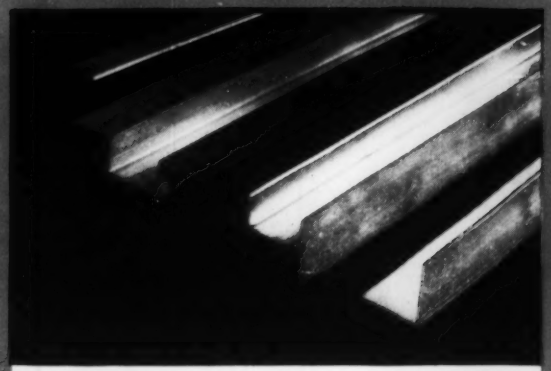

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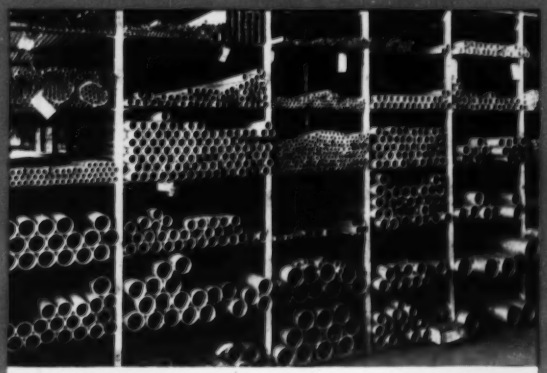

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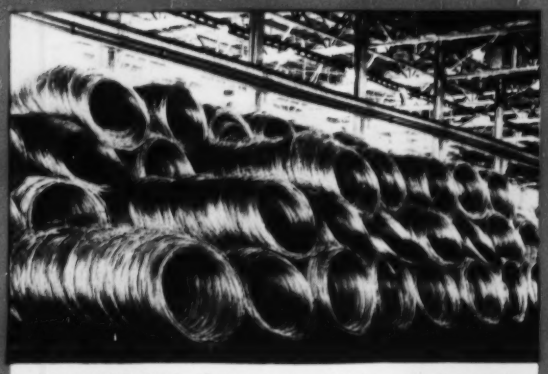

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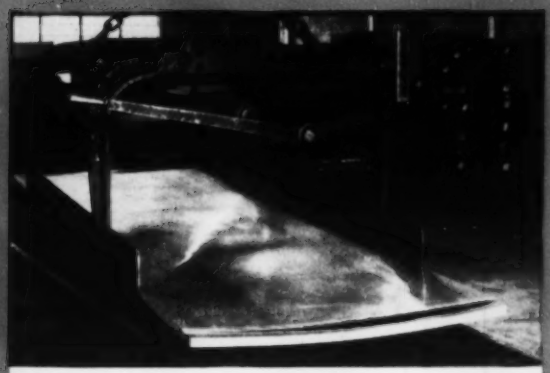
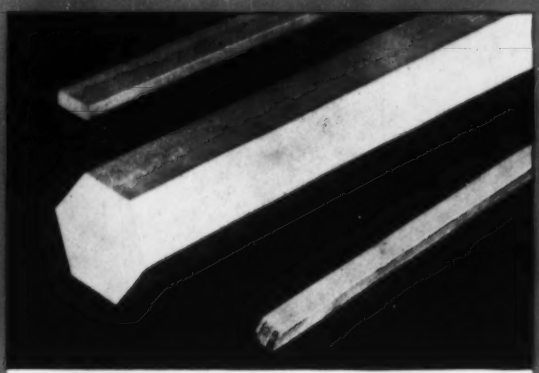


SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



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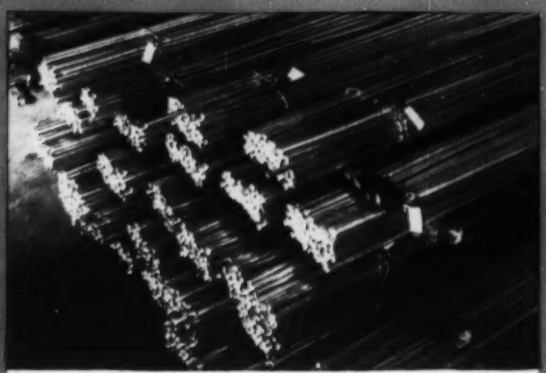

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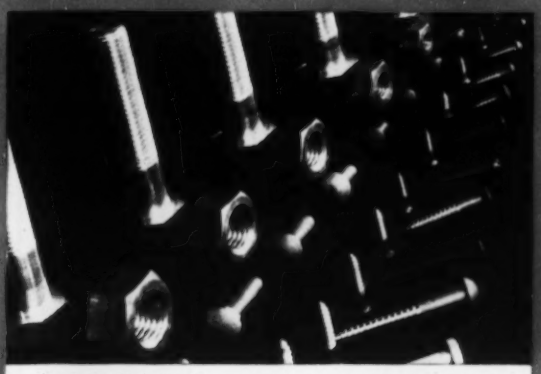

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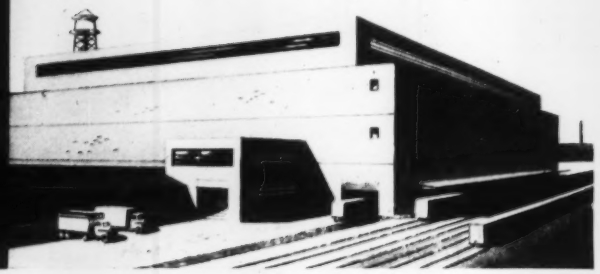

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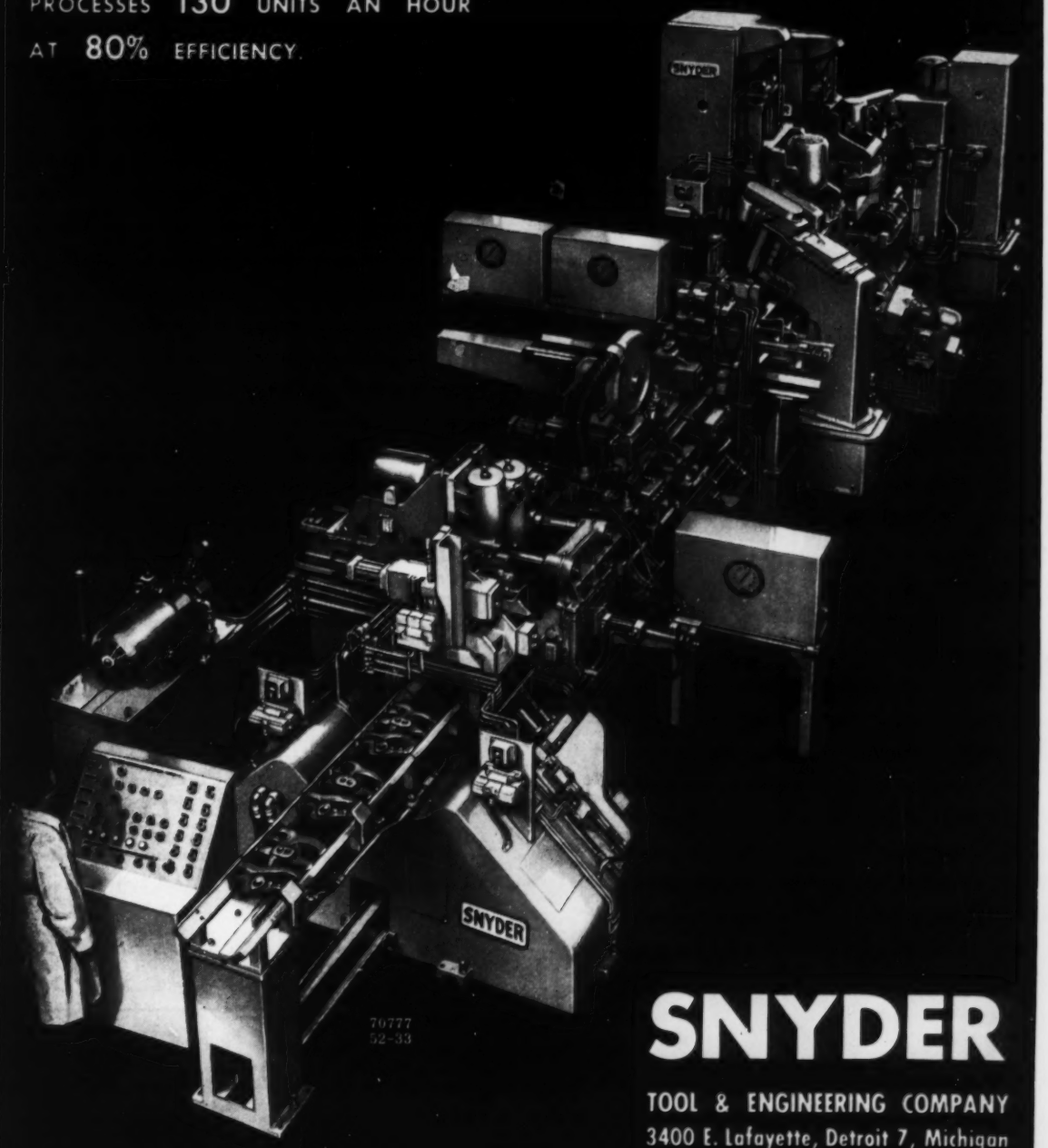

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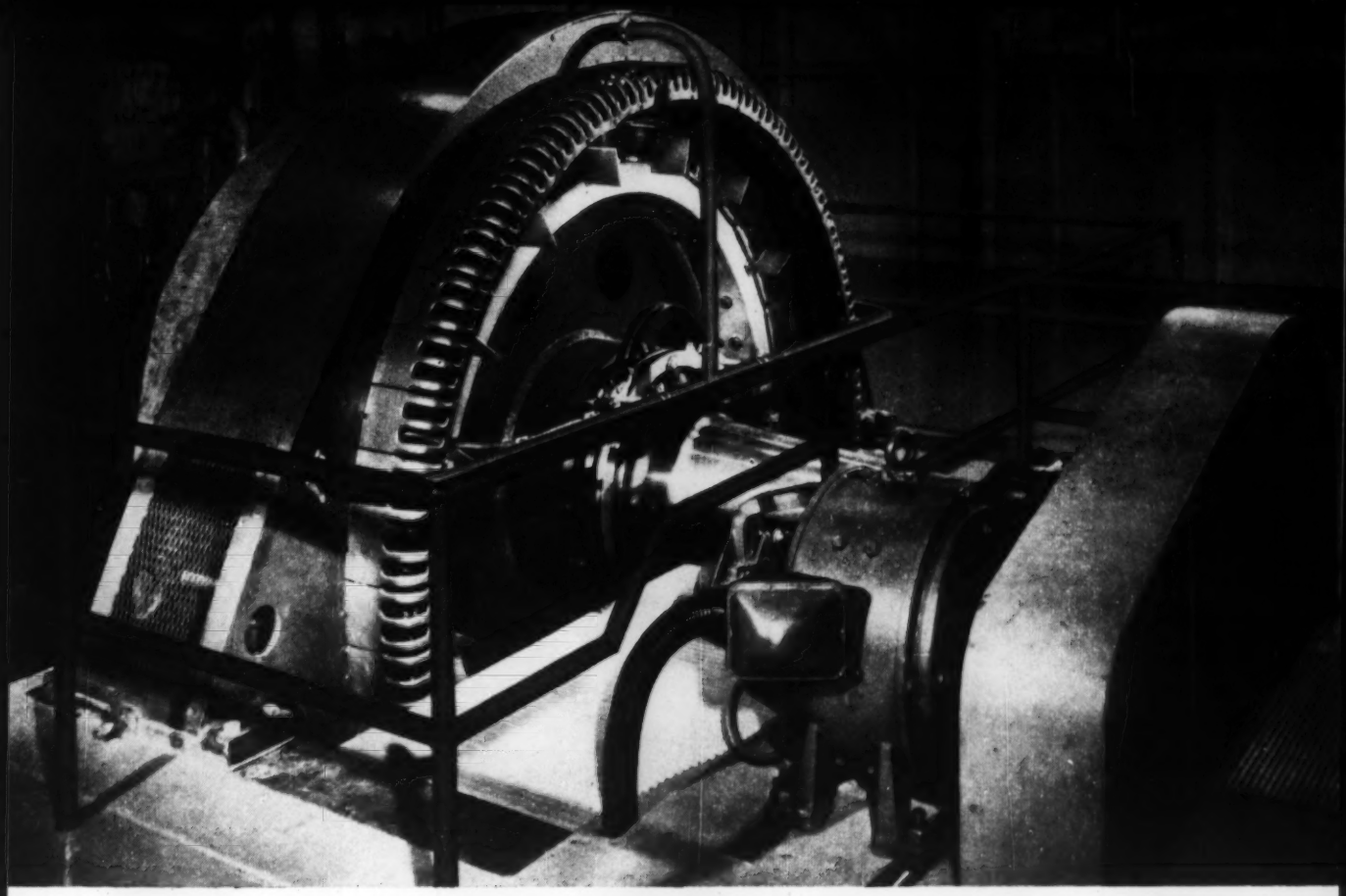

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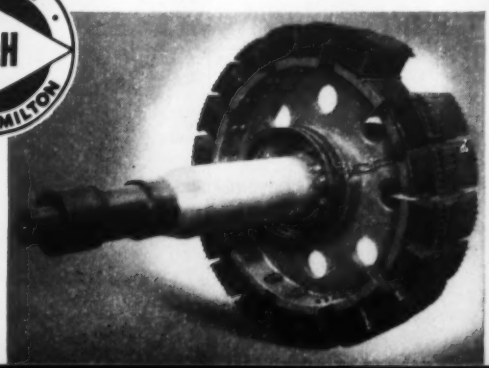

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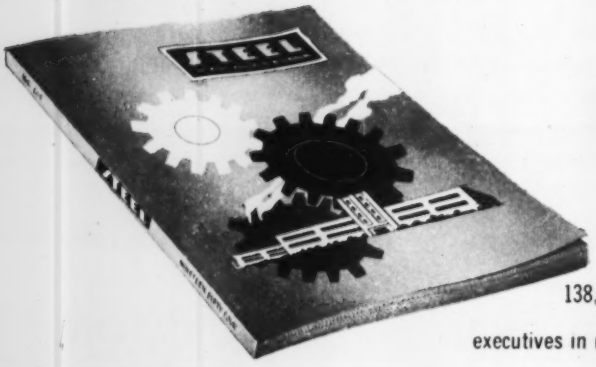

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R & M built this big 15-ton crane to lift and move structural steel—never a dainty, packaged commodity—with two-handed flexibility. Two 7½-ton R & M Type "F" Hoists, independently controlled from the cab of this double-girder, five-motor crane, eliminate dangerous load-balancing.

Maximum bridge deflection (loaded), ½". End truck length, 15' 2", wheelbase, 11'. Bridge speed, 250 fpm maximum. Bridge control, six-step variable speed. Bridge brake, foot-controlled hydraulic. Hoist lift, 20'. Lift speed, 20 fpm. Trolley control, four-step variable speed to 125 fpm. Total crane weight, 60,000 pounds. User, Kilroy Structural Steel Company, Cleveland, Ohio.

Pictured at right—45-foot span, 20-ton capacity R & M crane with 5-ton auxiliary hoist. Standardized cranes in single or double I-beam types available quickly in 20 to 65-foot spans; capacities to 10 tons.

☐ Have representative call ☐ Send Bulletin No. 825-B

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

ROBBINS & MYERS INC.

SPRINGFIELD, OHIO | BRANTFORD, ONTARIO

CALENDAR
OF MEETINGS

January 5-7, Institute of Scrap Iron & Steel Inc.: Annual convention, Saxony, Sans Souci, Sea Isle hotels, Miami Beach, Fla. Institute address: 1729 H St. N.W., Washington 6. Executive vice president: Edwin C. Barringer.

January 10-13, American Road Builders' Association: Annual meeting and exhibit, Roosevelt hotel, New Orleans. Association address: World Center Bldg., Washington 6. Executive vice president: Eugene Reybold.

January 10-14, Society of Automotive Engineers Inc.: Golden anniversary annual meeting, Sheraton-Cadillac and Statler hotels, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 12, Aluminum Extruders Council: Winter meeting, Saxony hotel, Miami, Fla. Council address: 209 Washington St., Boston. Secretary: Phillip Lemelman.

January 12-14, Southern Industrial Distributors Association: Midyear meeting, Edgewater Gulf hotel, Biloxi, Miss. Association address: 208 Peachtree Arcade, Atlanta 3. Secretary: Ted Pugh.

January 13, National Constructors Association: Annual meeting, Hotel Plaza, New York. Association address: 50 E. 41st St., New York 17. Secretary: C. B. Bronson.

January 14-15, Machinery & Allied Products Institute: Economic conference, Mayflower hotel, Washington. Institute address: 1200 18th St. N.W., Washington 6. Secretary: Charles W. Stewart.

January 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association address: 27 E. Monroe St., Chicago 3. Executive secretary: Harry P. Dolan.

January 18-20, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 19-20, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 20, Cutting Tool Manufacturers Association: Annual meeting, Oakland Hills Country Club, Detroit. Association address: 416 Penobscot Bldg., Detroit. Secretary: Martin J. Ewald.

January 20-21, Radio-Electronics-Television Manufacturers Association: Symposium on printed circuits, University of Pennsylvania, Philadelphia. Association address: 777 14th St. N.W., Washington 5. Secretary: James D. Secrest.

January 20-21, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 79 W. Monroe St., Chicago. Executive director: J. Dwight Evans.

January 21, Engineers Joint Council: General assembly, Hotel Statler, New York. Council address: 29 W. 39th St., New York 18. Secretary: Stewart E. Reimel.

January 21, Malleable Founders' Society: Semiannual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 23-27, Associated Equipment Distributors: Annual meeting, Conrad Hilton hotel, Chicago. Association address: 30 E. Cedar St., Chicago. Secretary: P. D. Hermann.

January 24-25, Industrial Heating Equipment Association Inc.: Annual meeting, Sheraton-Cadillac, Detroit. Association address: 412 Fifth St., N.W., Washington. Secretary: T. F. Sheckels.

January 24-25, Industrial Furnace Manufacturers Association Inc.: Annual meeting, Sheraton-Cadillac hotel, Detroit. Association address: 412 Fifth St., N.W., Washington. Executive vice president: Carl Ipsen.

January 24-27, American Management Association: General management conference, Statler hotel, Los Angeles. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

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on YOUR product. . . . a
PEDIGREE FOR PAINTED PARTS

Put this Detrex Paintbond label* on your product and increase its sales appeal. To your customers it indicates added value and a quality product throughout. Production-wise you'll benefit, too. Paintbond is easy to apply, positively seals metal against moisture and corrosion, improves finishes and is more economical to use. For complete details, send for free Paintbond booklet.

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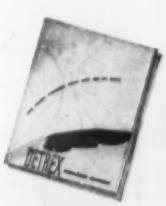

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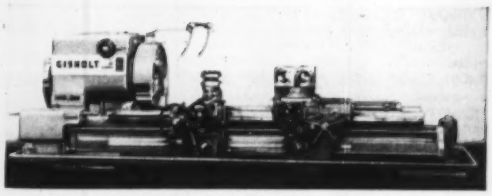
DEPT. PB-301, BOX 501, DETROIT 32, MICH.

"Here's why GISHOLT insists upon the HEAVIEST CASTINGS!"

Look at them . . . castings for the heaviest saddle type turret lathes in the business! Look at all the angles:

First, note how the headstock is cast integrally with the bed for perfect spindle alignment . . . how cross supports give the most solid base for carriages, tools and slides . . . how extra-heavy webbing gives the headstock the ruggedness to support powerful gear train members.

Remember, too, that cast iron absorbs vibration. The heavier the better! And Gisholt controls the quality of the finest nickel semi-steel in its own foundry.



The Gisholt 5L Saddle Type Turret Lathe has a net weight of 22,500 lb. without equipment.

What does it mean to you? You can load up your Gisholts with carbides and really turn out the chips! You've got the strength, the rigidity and the freedom from vibration to take all the speed you can get from today's carbides—with the heaviest feeds—and still have the safety margin to take care of tomorrow's tool bit developments.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

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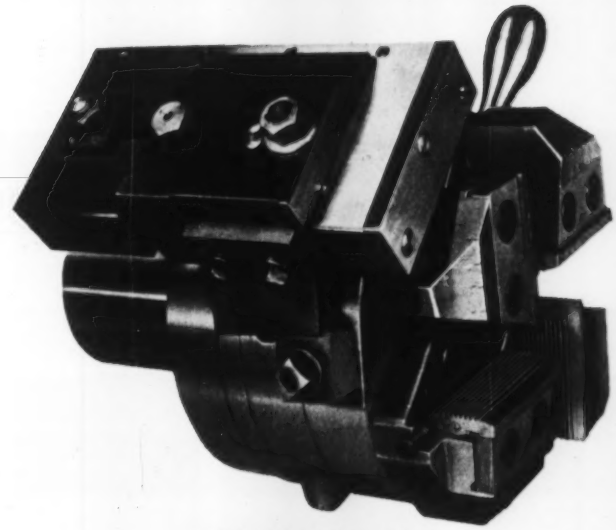
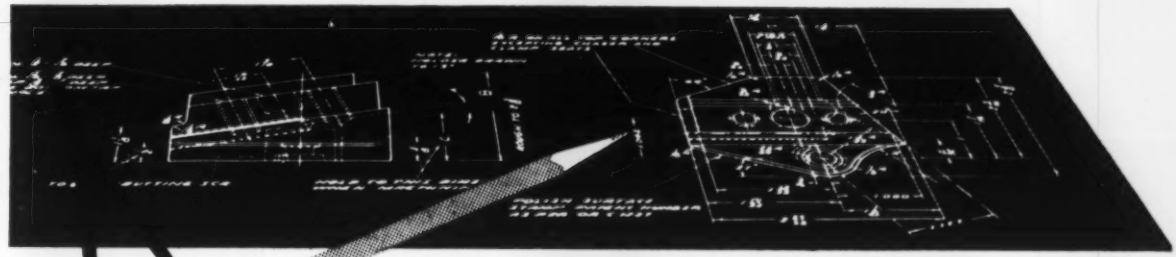


Non-deforming **MAX-EL** alloy steel parts require minimum finish machining



Because of its lack of distortion after heat treatment, the Landis Machine Company chose Crucible MAX-EL® 3½ for the chaser holder and other vital parts of the die head illustrated. For these MAX-EL parts can be machined extremely close to final dimensions *before* they are heat treated . . . after which only a small amount of finish machining is required.

MAX-EL's non-deforming characteristics combined with its excellent wearing qualities and great strength are important in high-speed turret lathe die heads . . . and in many other applications.

Your shop will benefit, too, from the ease of machining, freedom from distortion, superior quality and longer tool life you get with MAX-EL. To start taking advantage of MAX-EL *now, call Crucible.*

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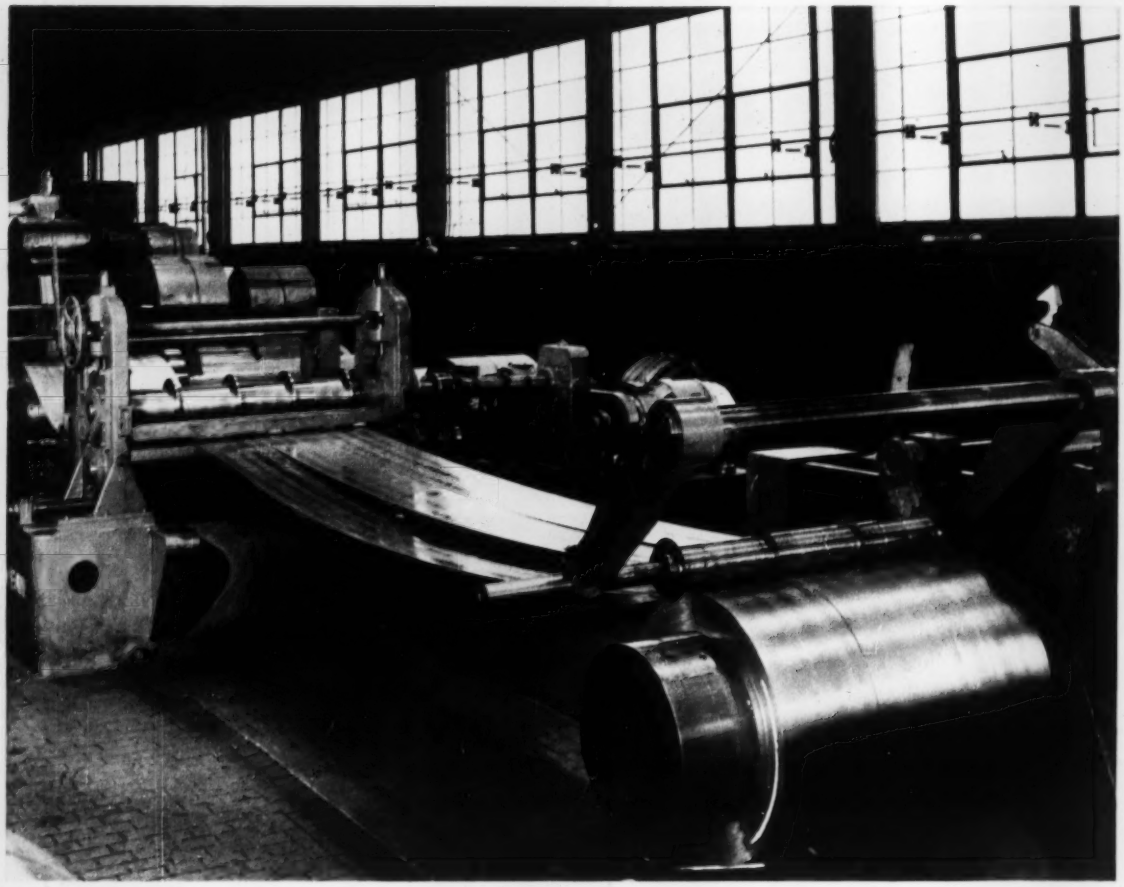


HERE'S HOW The WEAN Can Save You 20%

And

Here's A Simple Test That May Startle You

Want to save 20 percent on your steel costs? If you are using sheet steel in any great amounts a Wean Equipment engineer can quickly show you how the amazing new Wean Slitting and Flying Shear Line can effect this savings in your plant. Using your actual figures, Wean can, by a simple comparison method, quickly prove to you that these savings are possible. Why continue operating at high costs when this improved method could be saving you as much as $20 a ton on your steel?

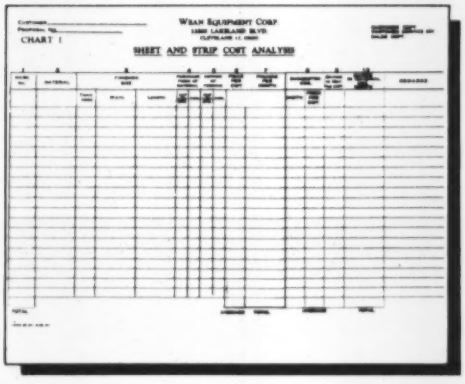
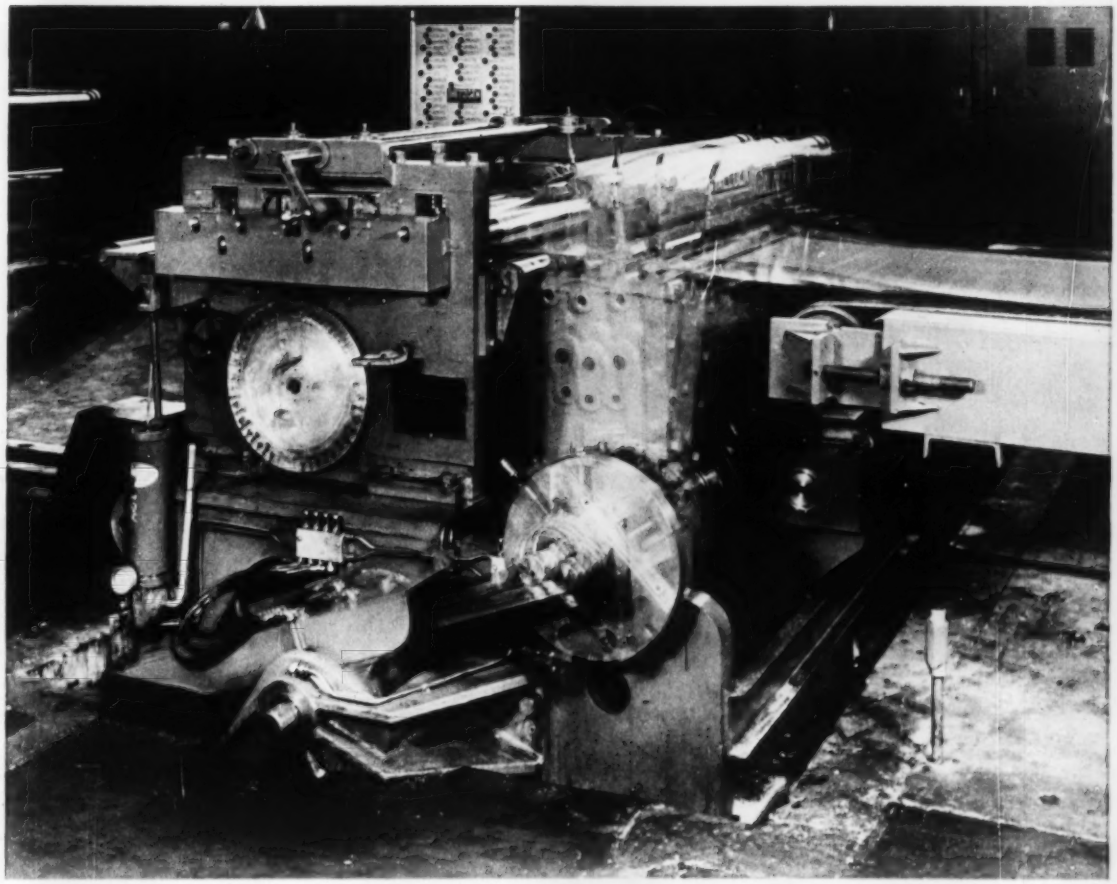

WEAN EQUIPMENT CORP.

CHART 1

SHEET AND STRIP COST ANALYSIS



Slitting and Flying Shear Line On Your Steel Costs

The secret of these tremendous savings is a short cut in getting steel from coil form to fabrication. If you are not one of those already using the Wean Slitting and Flying Shear Line you are either paying mill extras for shearing to tolerance and size or are forced to do this operation expensively and slowly in your own plant or a costly combination of both.

The Wean Slitting and Flying Shear System eliminates this entire processing function by converting steel from coil to production size, at resquared tolerances, at a rate of 100 cuts per minute.

Just figure it out for yourself. Apply these figures to your own operation. Total up the extras you are now paying for steel preparation and you'll see why it will pay you to talk with Wean.

Wean

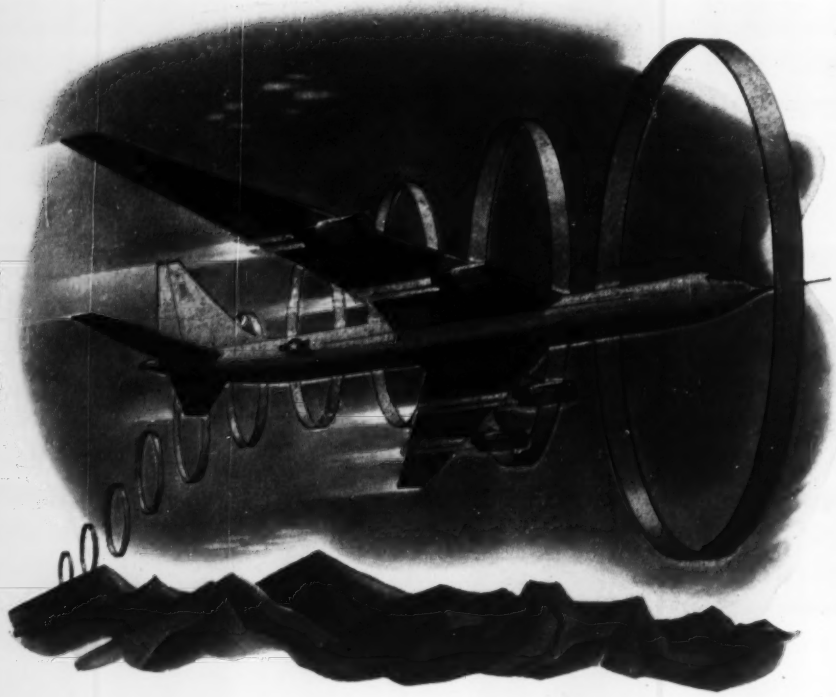
COMBINATION SLITTING and SHEARING SYSTEMS

WEAN EQUIPMENT CORPORATION OFFICES

Cleveland

Chicago Newark N. J. Detroit

Cable Address: Weancor



73 American Welded parts

IN EVERY J-57 JET ENGINE

For 35 years American Welding know-how has kept pace with the aviation progress. Today a large part of our extensive welding, machining and fabricating facilities are devoted to the production of welded components for U. S. jet engine manufacturers — 73 different kinds of parts on the Pratt & Whitney Aircraft J-57 turbojet alone.

This knowledge of welding and fabricating has also been applied to other industries. For example, if you produce a component like those shown here — or if you think fabrication by welding may be the solution to a particular problem —let us know. Our Product Development Division has been able to assist many companies with their metal fabricating problems and will be glad to consult with you.

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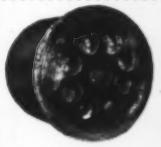
WELDING • MACHINING • FABRICATING

Tire Bases
Steel bands formed and flash butt-welded into wheel tire base for industrial trucks.

Wheel and Rim Assemblies
Weldment of carbon steel bar and plate for use on heavy earth-moving equipment.

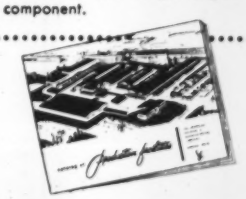
Motor Frames
Steel bars and plate formed and welded into industrial motor frame.

Compressor Cases
Welded band for hermetically sealed refrigerator compressor.



Armature Spiders
Weldment of six parts combining plate and bar stock.

Turbine Frame Assemblies
Formed sheet metal bands and flash butt-welded rings fabricated into a jet engine component.



Send for Free Catalog of American Welding Facilities

Metalworking Outlook

Spotlight on Ford

Gossip in Detroit has it that Ford will be the target in the United Auto Workers' drive next year for the guaranteed annual wage. General Motors' contract expires next May 29, Ford's June 1 and Chrysler's Aug. 31. Because of those dates, the prime target almost has to be GM or Ford. The reasoning is that Ford will be tapped because it has set 1955 as the year to surpass GM and will be especially anxious to avoid production stoppages.

U.S. To Hit Red Unions

The Justice department is about ready to take its first step under the tough new law aimed at Red-led labor unions. The law has teeth because it sets up machinery to bar any union found to be Communist-controlled from taking part in collective bargaining procedures supervised by the federal government. Early Justice department suits will probably be brought against the United Electrical Workers and Harry Bridges' longshoremen.

T-H and Right-To-Work Laws

The Taft-Hartley Law is the reason why President Eisenhower refused to give full administration support to Labor Secretary James P. Mitchell's speech denouncing right-to-work laws at the CIO convention. Under T-H, the union shop is permissible. But the act also specifically says that state work laws, if any, remain in effect despite T-H. States prohibiting or limiting the union shop are: Alabama, Arizona, Arkansas, Florida, Georgia, Iowa, Louisiana, Nebraska, Nevada, North Carolina, North Dakota, Mississippi, South Dakota, South Carolina, Tennessee, Texas and Virginia.

Presidential Proposals

President Eisenhower's major proposals to the 84th Congress will be: Continuation of the 52-per-cent income tax on corporations; continued excise taxes on autos, liquor and tobacco beyond Apr. 1 at the present rate; extensions of the President's government reorganization authority and of the Defense Production Act; continuation of the Small Business Administration; statehood for Hawaii; amendments of the Constitution to lower the voting age to 18; increased authority to cut tariffs; the ten-year defense highway construction program; T-H amendments and revision of the Fair Labor Standards Act.

Mr. Paley Revises

Columbia Broadcasting System's William S. Paley is upping 1975 national output estimates that he and his Materials Policy Commission made in 1952. The Paley report estimated gross national output in 1975 would be $566 billion measured in 1950 dollars. Now he says: "It would be reasonable to project the gross output that can be reached in 1975 on the same basis at a whopping $700 billion. This new estimate takes into ac-

count larger population totals now anticipated and also evidence of a faster climb in productivity than previously projected."

More Lithium Coming

Spurred by atomic energy developments, lithium demand and production are booming. Estimates put domestic output for 1954 at nearly 10 million lb of lithium carbonate, the basic primary lithium product from which the metal and the compounds are made. That capacity may top 26 million lb by the end of 1955, and by the end of 1956 it may soar to at least 34.5 million lb. Metallic lithium sells for about $13 per lb.

Need Money?

Generally good market conditions for those seeking loans on industrial property continue to prevail throughout the nation. The National Association of Real Estate Boards says that in most sections the predominant interest rate on industrial property with national credit "tenants" is 4½ per cent or less. About half the areas find 5 per cent and lower rates prevailing for local credit leases.

Policy for Dec. 24, 31

What do you plan to do about work schedules Dec. 24 and Dec. 31? A survey of 80 companies by Associated Industries of Cleveland reveals that about 50 per cent will close their plants all day Dec. 24, about 25 per cent will close at noon. The rest were undecided at survey time. For office workers, about half plan to close Dec. 24, about half will end work at noon. Policies are less liberal for the day before New Year. About 40 per cent will close their plants, 10 per cent will close at noon, 15 per cent will work all day. The rest were undecided. For office forces, 30 per cent will close all day, 25 per cent will close at noon, 20 per cent will work all day, 25 per cent were undecided.

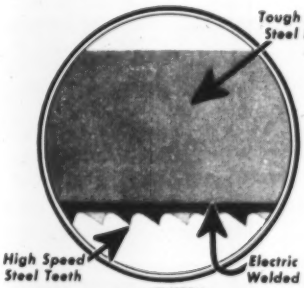
Straws in the Wind

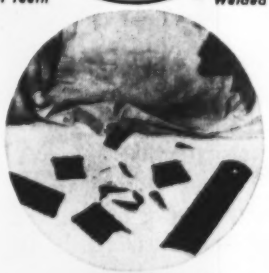
The automotive parts industry will enjoy a 10 to 14 per cent increase in business in 1955, predicts Joseph A. Anderson, general manager of GM's AC Spark Plug Division . . . Directors of Carrier Corp. and Affiliated Gas Equipment Co. will submit a merger proposal to stockholders . . . Defense Secretary Charles Wilson says that defense spending, currently at a $35.5-billion annual rate, is about as low as it can get . . . Don't look for any serious investigations of Communist workers in industry by the 84th Congress; the McCarthy queries of Bethlehem Steel Co. workers led nowhere.

This Week in Metalworking

The appliance business can be 10 per cent better in 1955 (p. 41) . . . Screw machine parts makers are digging for more civilian volume as defense work slides (p. 43) . . . Gray iron foundrymen plan an industry-wide promotion of their product (p. 44) . . . Although still high, capital spending will probably continue to slip in 1955 (p. 45) . . . Modified defense procurement policies should mean more slices of the military spending pie (p. 46) . . . Urged is a more uniform policy for leasing government equipment (p. 47).

Features Essential to Top Hack Saw Blade Performance





UNBREAKABLE—to saw FASTER.

Composite construction (a narrow high speed steel tooth edge electrically welded by the MARVEL-invented process to a tough, non-brittle alloy steel body), means that MARVEL high-speed-edge can be subjected to the MAXIMUM feed pressure that any hack sawing machine is capable of applying. MARVEL blades need not be "babied" for fear of breakage!

SHATTERPROOF—for SAFETY.

MARVEL blades never shatter or "explode" as do the ordinary "brittle" blades shown at left which so often cause personal-injury accidents such as the loss of an eye or severe laceration and expensive damage to the sawing machine. Operators who use MARVEL blades exclusively soon "get the habit" to apply heavier feeds, greater blade tension, higher speeds—to do their work faster, because they know they are SAFE with MARVEL.

SHARPER, PREMIUM-STEEL TEETH—to wear LONGER.

Teeth are accurately machined by a MARVEL-invented process that assures sharper tooth points and positive uniformity of tooth shape and degree of set from end-to-end of every MARVEL blade. The steel used in the tooth edge is carefully selected from the finest high speed steels available throughout the world, regardless of cost or source—truly premium steels, without premium cost.

QUALITY CONTROL—to assure UNIFORMITY.

With more than a quarter century of *experience* in inventing, perfecting, and producing welded-edge hack saw blades, MARVEL has provided its own laboratory with the most modern metallurgical instruments and techniques known to the applicable sciences for the specific purpose of maintaining highest possible quality control. Coupled with rigid tests and meticulous inspection of every MARVEL blade, uniform quality is assured.

These are only a few features that make MARVEL High-Speed-Edge Blades such outstanding performers.

Ask for the latest MARVEL Cutting Tool Bulletin and the name of your closest MARVEL Distributor.

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DSC HIGH "C" SPRING STEEL*

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Through a happy combination of *closely controlled* cold reducing and annealing practices, you get just such UNIFORMITY in DSC HIGH "C" STRIP — end . . to . . end of each coil — coil . . to . . coil in each lot — lot . . to . . lot on repeat orders.

*Hard rolled untempered and soft annealed only

THICKNESS: Up to about .187" WIDTH: Up to about 22"

FINISH (when a factor): Satin or Bright EDGE: Slit or Rolled Coils or Cut Lengths

How about a demonstration on one of your jobs—high carbon or low?

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YOUR GUIDE TO DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets
Low and Medium Carbon Manufacturers' Wire
High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement
Rope Wire Tire Bead Wire Welded Fabric
Cold Rolled Carbon Steel Strip
Cold Rolled Carbon Spring Steel

Blindman's Buff is no way to fill your orders for Sheet and Strip Steel!

Our business is selling ready-made sheet and strip steel.

In our work we run into jobs and jobs. Some are "duck soup"—almost "any old iron" might do. Generally, though, it takes quite a bit of "steelmanship" to select in-stock material that's best suited for a *particular* job, at a *particular* time, for a *particular* user. For example, yourself.

Playing blindman's buff with your order is out. We've got to see the "facts" behind it. That way we can put our hands on the "mechanics" and also the "economics" of your job and of the steel you need.

Getting at such facts and interpreting them pretty well sums up the Reliance *Job-Fitting* Idea —knowing your job . . . knowing our "stuff" . . . supplying in-stock steel best suited to your purpose.

Why not see for yourself?

Call our nearest plant or office anytime we can be useful.

RELIANCE STEEL DIVISION

DETROIT STEEL CORPORATION

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T.M. REG. U.S. AND CANADA

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Coils • Cut Lengths • All Tempers

SHEETS

Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne

Standard or production sizes
Sheared or Slit to Actual Working Dimensions

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Unmasking Reuther's Bogeyman

"Automation Makes Guaranteed Wage a Must."

That is a featured headline in the December issue of the *United Automobile Worker*, official publication of Walter P. Reuther's union of the same name. Devoted to the union's 1955 demands against the automotive industry, this issue assigns top priority to the annual wage.

Automation is built up as a bogeyman that is going to create mass unemployment by replacing workers with robots. It is argued that "automation clearly increases the need for the guaranteed annual wage."

In further support of the annual wage, the union contends that it would provide a strong economic incentive to employers to plan for regular employment and production.

Thus is introduced a dispute that will rage through metalworking labor-management circles until the annual wage controversy is resolved.

This much you can be sure of. Technological unemployment, Mr. Reuther's bogeyman, scares few in management, even though many will sympathize with the union's desire for steadier jobs and employment.

There is much evidence that automatic machines, which have been with us for a long time, actually increase rather than decrease employment.

One of this generation's most aggressive labor leaders, the late Philip Murray, said in 1951: "I do not know of a single, solitary instance where a great technological gain in the United States has thrown people out of work. I do not know of it, I am not aware of it, because the great industrial revolution in the United States in the past 25 years has brought into the employment field an additional 20 million people."

Going a step farther, we suggest that automation may accomplish the stabilization so much desired by Mr. Reuther's union. Modern, automatic factories are expensive. They have high fixed depreciation charges, property taxes and capital money costs. They require high salaried and maintenance payrolls whether they operate or not. To produce goods in huge quantities at low costs, they must run steadily. Industry cannot afford idle automatic factories.

It follows that automation provides a strong economic incentive for regular and continuous production and employment.

Walter J. Campbell

MANAGING EDITOR

STABLE PRICES: A remarkable aspect of 1954 has been its price stability. Yes, auto dealers have been giving unrealistically high trade-ins on old cars, and the discount houses have flourished in appliance selling. But, all in all, prices have been steady, as witnessed by

the virtually level consumers' price index this year.

In 1949 prices slid, and, of course, they dipped disastrously during the 1930s. In practically every economic dip, prices have been the first to feel the pinch.

Not so, this time. And this has been a big reason why the 1954 recession has been so mild. Stable prices have helped keep profits up, expansion programs high, the psychology of business optimistic.

Why stable prices? Many causes contribute to the phenomenon, but two stand out: High fixed costs, particularly in wage rates, make it impossible in many industries to cut prices and still make a profit; industry has also experimented with other means to boost sales—better selling methods, better quality, better service.

As we pull out of this 1954 economic dip, industry has surely proved that selling, quality and service pay off. They are the best antidotes to recession.

HOW POOR?: Union leaders and the labor press for nearly a year have been soft-pedaling inflation as a reason why wage increases are necessary. And no wonder; there has been no inflation. But they are digging up other reasons—automation, the need for a higher standard of living and so on. No matter what the reasoned argument, their basic appeal is to financial inequity. Yet, how poor are manufacturing workers?

From 1914 to 1919, the consumer price index rose 72.5 per cent, average hourly earnings 113.9 per cent. From 1919 to 1929, prices fell 0.9 per cent, but wages jumped 18.7 per cent. Even from 1929 to 1939, wages climbed 11.8 per cent, while prices slid 19 per cent. Since 1939, prices have jumped 93.1 per cent, but earnings have climbed a whopping 185.9 per cent.

BETTER COMMUNICATIONS: Industry's intraplant comunications have come in for a thorough revamping in recent years. The best example is the almost universal application of radio to handling and service functions. Now closed-circuit television is headed for broader use, particularly in process control. STEEL's progress report on p. 74 turns up some significant installations, particularly in the steel industry, that brighten possibilities for industry acceptance of this vision-extending medium.

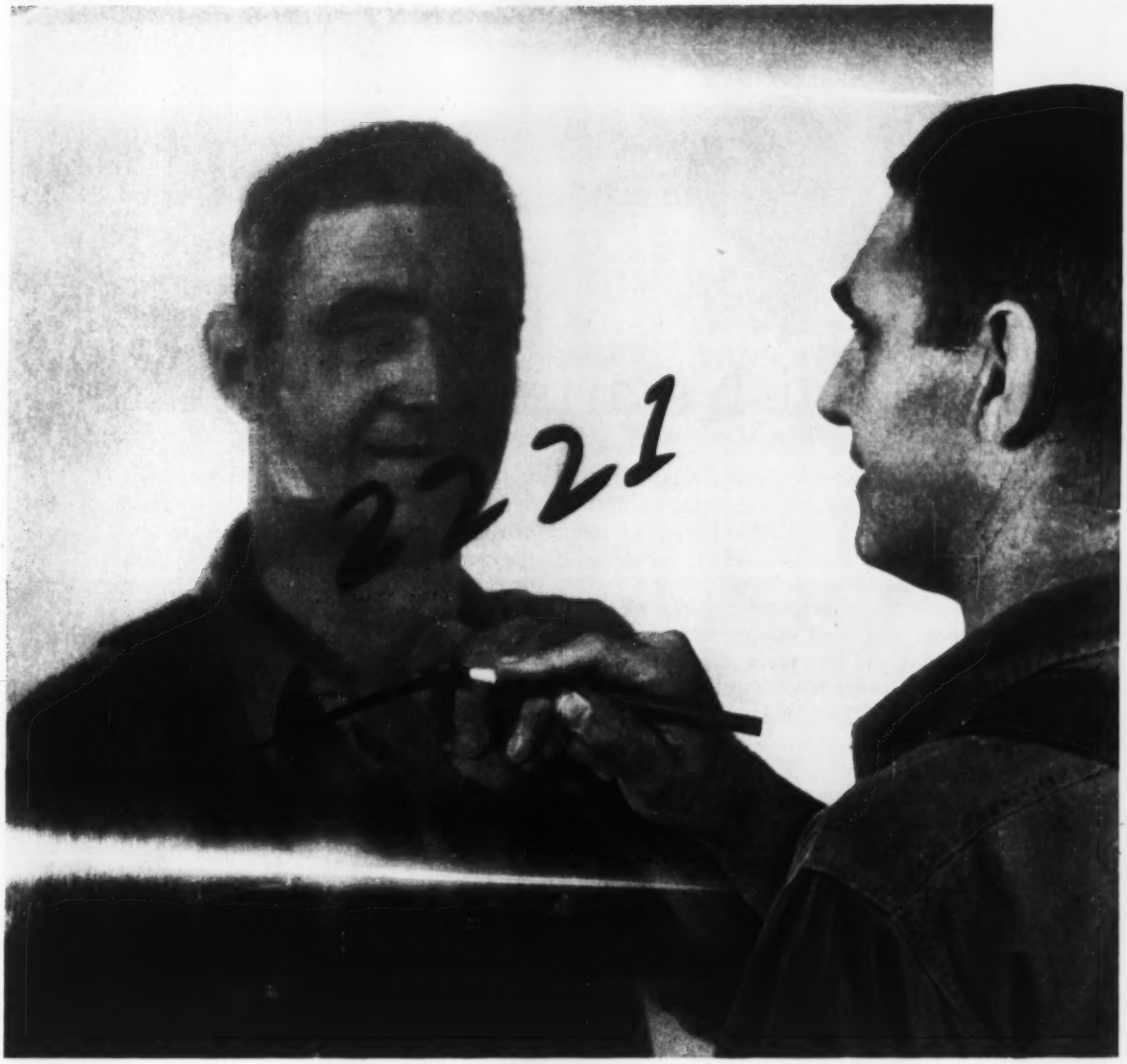
NEW OPPORTUNITY: A few weeks ago the U. S. offered to earmark 100 kilograms of fissionable material for peaceful uses by other countries. Throwing light on the scope of the proposal, atom experts estimate that amount of uranium 235 will keep 15 research reactors like the new CP-5 (p. 80) in operation for five years—and still leave two thirds of the fuel unconsumed!

For all intents and purposes, CP-5 has been declassified. Information on its construction and operation will be available to our industry. In five years (thanks to the new Cole-Hickenlooper act) American inventiveness will be about as free and easy in the atomic energy field as it is in others, predicts Lewis L. Strauss, AEC chairman.

"FOREIGN AID": Prices on steel from Europe are advancing sharply (p. 109), and they are expected to go higher before the end of this year. These price increases stem from a continued rise in demand in Europe for steel. Delivery promises there are extending markedly. Not only are European steel prices going up but there is the prospect that ocean shipping rates will be advanced $1 to $1.25 a ton Feb. 1.

Even though steel exports from the U. S. are only 4 per cent of our output this year, and imports are much less than that, all price boosts on foreign steel are helpful to U. S. producers. They eliminate some foreign competition; at the same time, demand for steel opens up abroad. U. S. producers could handle more business, for they still have unused capacity; they're making ingots at about 82 per cent of capacity.

This turn of events could be called foreign aid, with the aid coming our way for a change.



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Geneva Modern Kitchens are long-time users of Inland cold rolled sheets because they know they can depend on their being uniform in workability and finishability, shipment after shipment.

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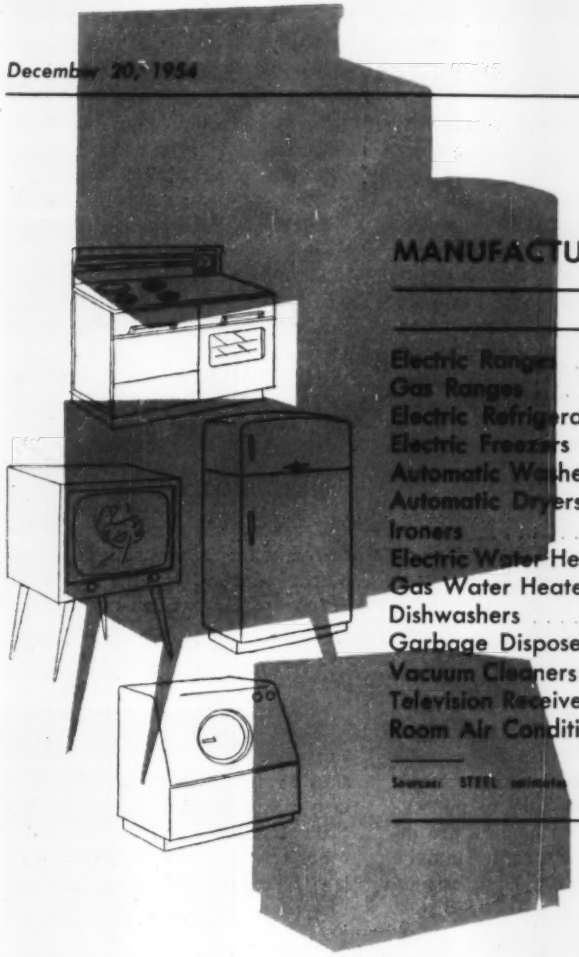


MANUFACTURERS' UNIT SALES TO CLIMB IN 1955

	1953	1954	1955
Electric Ranges	1,119,570	1,200,000	1,260,000
Gas Ranges	2,183,300	1,960,000	2,000,000
Electric Refrigerators	3,378,478	3,260,000	3,340,000
Electric Freezers	763,629	875,000	960,000
Automatic Washers	2,070,800	2,200,000	2,400,000
Automatic Dryers	696,468	625,000	700,000
Ironers	154,464	100,000	110,000
Electric Water Heaters	775,500	800,000	825,000
Gas Water Heaters	2,125,700	2,250,000	2,300,000
Dishwashers	180,000	200,000	250,000
Garbage Disposers	353,000	425,000	450,000
Vacuum Cleaners	2,781,263	2,000,000	2,300,000
Television Receivers	7,214,000	6,800,000	6,500,000
Room Air Conditioners	1,044,700	1,200,000	1,100,000

Sources: STEEL estimates for 1954, 1955; manufacturers' associations for 1953.

Appliance Sales in '55: No Cause for Tears

WITH THE WAY the economic cards are stacked, some appliance makers figure to set records in 1955 if they play their hands right.

Cause for Competition—Dollar sales will be up, they say, and so will unit sales—probably about 10 per cent over-all (see table). But rising costs and more sales on the lower-priced, less-profitable ends of the appliance lines will trim profit margins, hold 1955's profits about equal to 1954's. And since all manufacturers will be trying to sell more units to keep up with shrinking profit margins, increased unit sales will be necessary.

That adds up to stiffer competition again next year, and here's how industrymen foresee its effect on buying, manufacturing and selling habits in 1955.

Buying—There'll be no big changes in steel buying habits. The trend toward substitute materials to reduce costs will continue, of course, but it will not disturb the over-all amount of steel consumed by appliances. For one thing, steel is just about holding its own with other materials in finding new uses in appliances. Says Westinghouse Electric's TV-Radio Division: "Our own series of 21-inch Capri TV receivers exemplifies the trend toward steel chassis cabinets. We have found that these steel cabinets not only cost us less, but can be more readily treated with roll-on finishes to satisfy diverse customer tastes."

Components buying will continue from suppliers who, through specialization, can produce good quality parts cheaper than the appliance makers themselves. Watch the trend, however, for appliance manufacturers to pull in fabrication of more components within their own organizations as shorter runs on particular models indicate such integration.

Manufacturing — Two trends: One is toward fuller model lines to catch the widest possible range of potential buyers. Says F. F. Duggan, vice president, Deepfreeze Appliance Division, Motor Products Corp.: "Deepfreeze looks forward to the biggest unit and dollar sales year in its history. This reasoning is based on the line of Deepfreeze appliances covering all price classifications and all unit-type requirements." The other trend is toward cost-cutting in the manufacturing processes.

Selling—Big changes in the offing here. Prices, despite all the

manufacturers can do, will probably rise gently in 1955. "Leader" appliances will stay low; more de luxe models will get the price hikes. General Electric has perhaps signaled a major shift in pricing of major appliances by announcing it would not factory-price certain of its major appliances for 1955. Distributors will set the selling price on a local level. If this works out to dealers' satisfaction, you can expect other manufacturers to follow suit.

Just as economic conditions have leveled out, demand for some appliances has leveled out, too.

Take **refrigerators**. A study by the National Industrial Conference Board indicates sales of replacement refrigerators represent 55 per cent of total sales in 1954. In the period from 1946 through 1948, replacement sales accounted for only 25 per cent of total. Look for innovations aimed at stimulating replacement.

In 1954 replacements accounted for 45 per cent of total **washing machine** sales, compared with an average of 32 per cent in the 1947-1949 period. The **automatic washer**, however, still has a large demand in replacement sales. So much so that the automatic washer together with the **dryer** were the appliances voted most likely to be "hot sellers" in 1955.

Electric ranges enjoy a substantial new-sale market, as replacement sales accounted for only about 33 per cent of 1954 purchases. **Gas ranges** will probably have moderately increased sales, based on extensive redesign, in 1955. Said George D. Roper Corp.'s Vice President J. H. Makemson: "Our planning is based on 1955 . . . offering opportunities for increased sales to those with the most satisfactory product and appropriate sales programs."

Next to automatic home laundry equipment, **freezers** are the popular choice to enjoy greatly expanded sales in 1955. Don't expect the skyrocket growth of TV, but percentagewise, freezer sales will outrun ranges and refrigerators.

An important facet of any major appliance's sales outlook for 1955 is the new home market. Many house builders, wishing to put extra value into their houses, are including appliances right in the mortgage price. That's one reason laundry equipment and freezers look good for '55.

Room air conditioners will enjoy good sales in 1955 but an inventory glut won't allow production to increase accordingly.

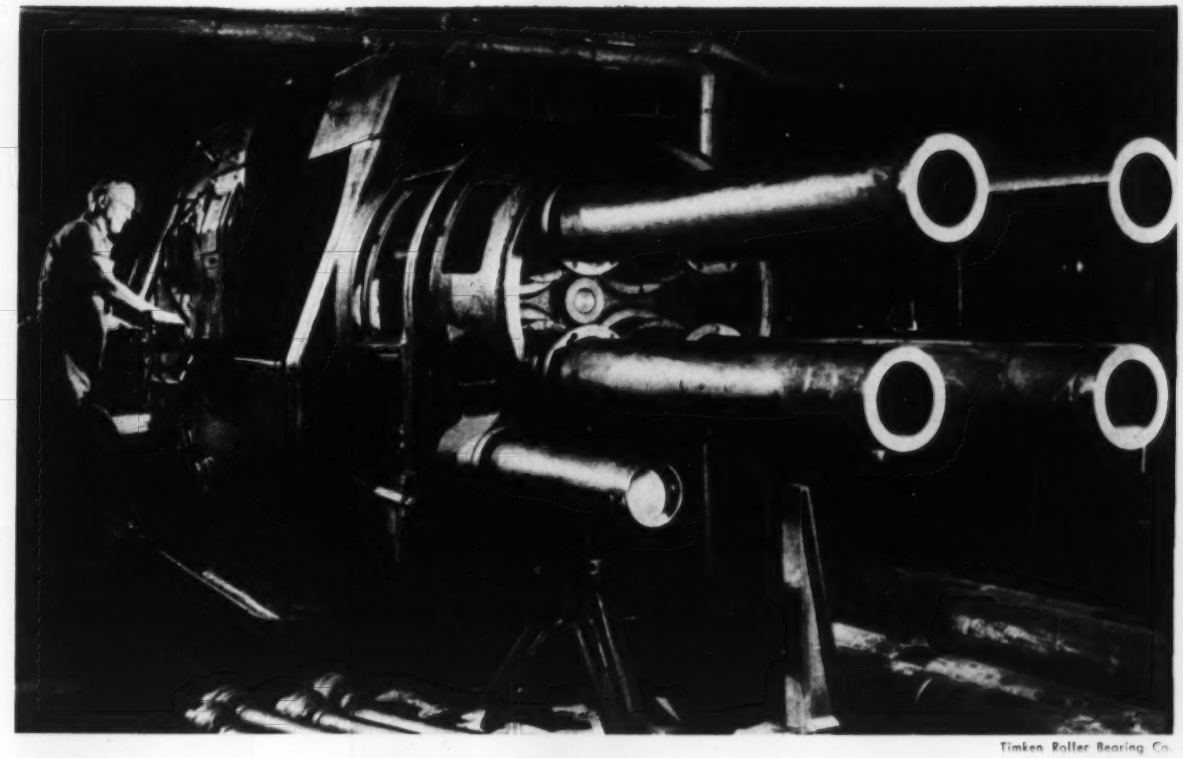
Television Receivers: Slightly fewer black and white sets in 1955 than in 1954. Lower priced sets will be the bigger sellers as purchasers fill in until color TV becomes available. As for color, only 30,000 to 40,000 sets will be sold in 1954, probably less than 300,000 sets next year.

Trailer Orders Roll In

Fruehauf Trailer Co. has received what is certainly one harbinger of good business in 1955: A total of $20 million in orders for more than 2500 new civilian commercial trailers, one of the biggest single batch of new orders in truck transportation history.

They came from Associated Transport Inc. (500 trailers), Keeshin Freight Lines Inc. (500 trailers), National Trailer Pool Inc. (200 trailers) and a number of other trucking firms over the country (1300 trailers).

Reasonably good sales next year for television receivers . . . second-set TV ownership will become a key factor



Timken Roller Bearing Co.

Although hurt by leaner military spending diet . . .

Screw Part Sales Fatten on Civilian Goods

THE THIRD-QUARTER UPTURN in demand for products of screw machine job shops will carry through into 1955, says a report from National Screw Machine Products Association.

But the report shows that 1954 business levels have dropped conspicuously, hit especially hard by curtailments in military spending. The industry's best year was 1953, when shooting-war spending drove the gross up to about $600 million. This year, the association figures that sales will be about $400 million (see table).

Army Cuts Spending—About 15 per cent of this 33 per cent decline is directly traceable to the falling-off in military procurement. Heavy cutbacks have been made in fuses and bullet cores, both volume screw machine products. The conversion from piston to jet engines also virtually erases another large screw machine market.

There are 1800 companies producing screw machine products, concentrated mostly in Illinois, Michigan, Ohio and the New England states. Most of them are fairly small. But despite the business shake-up this year, no unusual number of failures has been reported and the price-line has held quite firm.

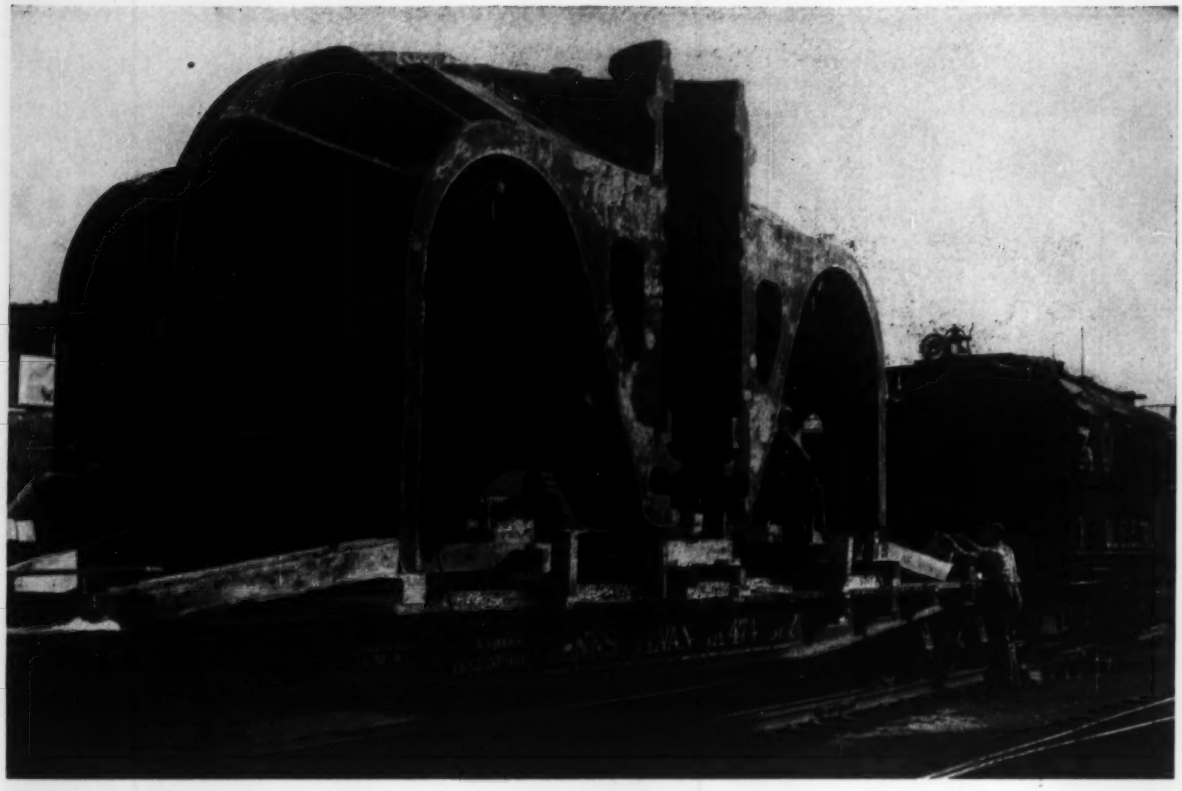
Consumer Holds Firm — This solidity in the face of apparent minor disaster has a sound base. Foundation business of the screw machine products industry is in such consumer durables as automobiles, radios, television sets and other household appliances. These industries have all undergone readjustment in the last year, but all are on the threshold of new gains.

Long-term predictions are also optimistic. Assuming that defense spending continues at present levels, it's estimated that total annual business will amount to $500 million by 1960. The $100-million increase from today's levels is largely based on the new consumer markets that will open up when the post-war baby crop converts from soft to hard goods.

How Defense Spending Affects Screw Machine Product Sales

1960	$500,000,000	*with present rate of defense spending*
1954	$400,000,000	
1953	$602,000,000	*during Korean shooting war*
1947	$220,542,000	*immediately after World War II*

Source: National Screw Machine Products Association.



Big 65-ton Westinghouse turbine base ships out from foundry

New Growth Ahead for Gray Iron Castings

"OF COURSE I'M OPTIMISTIC," retorts the gray iron founder. "My customers expect a good year in 1955, and nobody's talking depression any more."

Both the Gray Iron Founders Society and various foundry leaders shrug off any suggestion that there is cause for permanent worry because castings shipments in 1954 are figured at only 12 million tons, as against last year's high of 13.6 million.

GRAY IRON SHIPMENTS REVIVE

YEAR	NET TONS
1955	*13 million plus
1954	*12 million
1953	13.6 million

*Estimated

From a Sound Base—Rather they say: " For the first time since 1939, things are normal . . . this year's drop represents the scramble down from an artificial high . . . right now we're starting on up again from a stable base."

Facts and figures bear them out. A new GIFS statistical survey shows that about 70 per cent of total foundry tonnage goes into combined automobile, construction, utilities, machine tool, agriculture and steelmaking equipment markets. Add general machinery, home appliances, heating equipment, petroleum industry, municipal castings, electrical motors and parts, papermaking machinery and materials handling equipment and you have the present markets for almost 90 per cent of tonnage.

Almost without exception, these industries are expected to do well next year. Agriculture has been the only sick man in the family, and there, too, buying is expected to pick up.

Predictions — "Casting inventories are so far down," says H. L. Edinger of Barnett Foundry & Machine Co., Irvington, N. J., "that business has no place to go but up. I believe that 1955 will see the industry back up around the 13 million-plus figure of 1953." Don Workman, executive vice president of the society, also estimates that 1955 will see shipments of above 13 million tons.

Kicked home by this year's rough competition—there have been at least 150 business failures—new management attitudes are gaining strength in gray iron foundry circles. Conservative family-formula perspectives have been forcibly broadened.

And Action—More and more emphasis is being placed on plant modernization, product improve-

ment and establishment of better industry-wide standards. The accent on low-cost production has been so great that some smaller captive foundries have been buying outside from progressive job shops working with automated facilities.

Even more important, management is intensifying its plans to broaden markets. One yardstick is to compare gray iron shipments with those of finished steel. Gray iron shipments in 1953 were 9 per cent above 1947's, finished steel deliveries rose 27 per cent in the same period. By aggressively promoting both their products and their industry, gray iron leaders hope to better the Paley report estimate of 20-million-ton annual shipments by the 1970's.

Where Will Titanium Go?

Object of a new titanium study will be to determine what shapes and alloys are going to be in demand and what steels are likely to be displaced by the metal.

A project of the Iron & Steel Division, Business & Defense Services Administration, its results will be made available to those who have shown interest in proposed rolling facilities for titanium mill products.

War on Air Pollution

The American Iron & Steel Institute reports that steel companies are having more success in their fight against air pollution. Companies in one community spent $4.3 million for facilities over a three-year period. One plant invested $600,000 in four precipitators for its open-hearth stacks. Another has three greenhouses and retains naturalists to make periodic plant life surveys to make sure that its activities do not interfere with agriculture.

Research sponsored by the companies through the AISI in the last four years has led to the development of effective pollution analysis instruments. It has been found through these instruments that there is no relationship between the fine haze or smoke emission at the top of a stack and the coarse dust particles that may descend on a community.

Spending in 1954 slightly above forecast but . . .

Plant Outlay Decline Seen in '55

OUTLAYS for new plant and equipment in the first quarter of 1955 will run at an annual rate of $26 billion, which is slightly below the fourth quarter, 1954. That's the report (based on estimates by businessmen) of the Department of Commerce and Securities & Exchange Commission.

The fixed investment in the third quarter this year, according to the survey, was at a seasonally adjusted annual rate of $27 billion, while the fourth quarter is expected to total $26.6 billion. Both figures are slightly higher than anticipated outlays reported by businessmen last August.

Investments Down — Manufacturing investment has shown a downward trend during 1954, but outlays are expected to exceed $11 billion for the entire year. Manufacturers anticipate this rate will continue into the first part of 1955. Electric and gas utilities have scheduled some reduction early next year from their 1954 construction programs. Spending by trade, communications and non-rail transportation companies is expected to remain steady.

Railroads, on the other hand, plan a rise in spending of almost 20 per cent above fourth quarter, 1954, for the first three months of next year. This year railroads cut their investment outlays sharply below 1953 spending.

Durable-Goods Slip — Expenditures by durable-goods manufacturers continue their downward trend through the fourth quarter of this year and will show little change in the first quarter of 1955. Outlays are scheduled at a seasonally adjusted annual rate of $5 billion in the first quarter of 1955, compared with $5.5 billion in the first quarter of 1954. First-quarter programs of primary iron and steel and nonferrous metals companies are substantially below actual capital outlays in the opening quarter of this year.

Expenditures by nonmanufacturing industries in the aggregate have held up well this year. Programs for the first quarter, 1955, are scheduled at an annual rate of $15.2 billion, with increases in railroad and commercial investment offsetting declines in mining and public utilities.

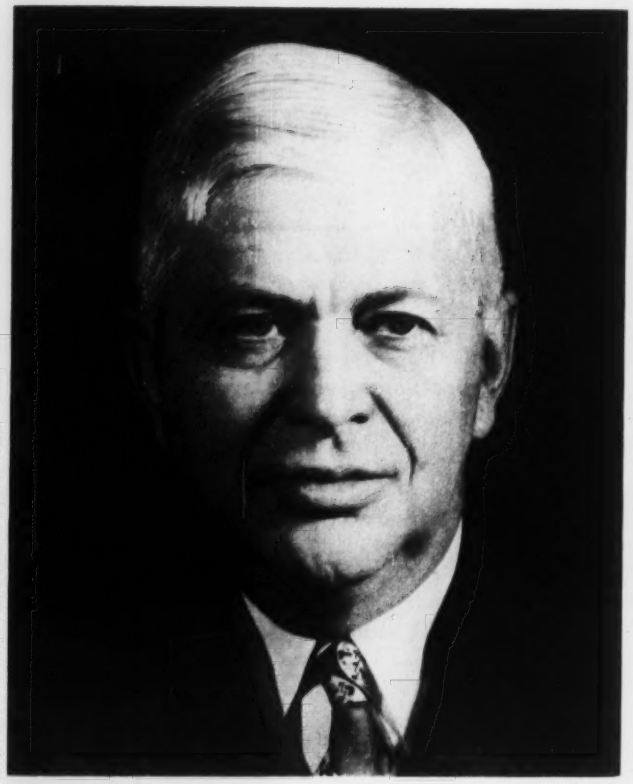
EXPENDITURES SLIP ON NEW PLANT AND EQUIPMENT

Seasonally Adjusted at Annual Rates

(billions of dollars)

	1953	1954			1955
	FULL YEAR	JAN.-MAR.	APR.-JUNE	JULY-SEPT.	OCT.-DEC.	JAN.-MAR.
Manufacturing	12.28	11.87	11.37	11.30	11.11	10.79
Durable	5.82	5.50	5.29	5.15	5.01	4.96
Nondurable	6.46	6.37	6.08	6.15	6.10	5.83
Mining	1.01	.95	1.06	1.02	1.10	.93
Railroad	1.31	1.06	.92	.79	.62	.74
Transportation, other than rail	1.46	1.47	1.36	1.40	1.39	1.40
Public utilities	4.55	4.29	4.43	4.12	4.07	3.78
Commercial and other	7.78	7.84	8.05	8.37	8.30	8.40
Total	28.39	27.48	27.19	27.00	26.59	26.03

Estimates for the fourth quarter, 1954, and the first quarter, 1955, are based on anticipated expenditures reported by business in November, 1954.
Source: Department of Commerce, Securities & Exchange Commission.



Defense Secretary Wilson's new policy means . . .

More Slices in the Military Pie

SPREAD OF MILITARY BUYING over a greater number of contractors will result from instructions given to Army, Navy and Air Force by Defense Secretary Charles E. Wilson.

Official abandonment of the policy of relying on the concept of "single, efficient producers" is spelled out in directive No. 3005.3. The armed services are asked to review assignments for production under full mobilization of the 1000-odd military end-items in the Department of Defense Preferential Planning List.

Nine Factors — In this review, nine factors are to be taken into consideration. They include maintaining multiple sources of supply, geographical dispersal and avoidance of undue concentration of contracts with a few leading suppliers. Other factors are preservation of skilled labor forces, use of existing open industrial capacity, preservation of essential management know-how and organization, maximum subcontracting and any other factors relevant to keeping the mobilization base sound.

All of the armed services have been instructed to place responsibility for complying with the new orders on the shoulders of their assistant secretaries for procurement, who are given until Jan. 6 to make the necessary changes. They are to report to Thomas P. Pike, assistant secretary of defense for supply and logistics.

In Line — Mr. Pike is chiefly responsible for shaping the new policy, which brings the Defense department into line with a recent policy change announced by the Office of Defense Mobilization (STEEL, Dec. 13, p. 58).

The new instructions do not mean any liberalization in the prices the government will pay contractors. "Comparative price experience shall be utilized to negotiate the best possible prices for the government."

Lift for Material Handlers

More liberal depreciation provisions in the 1954 tax law may give sales a push

OUTLOOK FOR SALES: Excellent. In a nutshell, that was the composite forecast for 1955 at the ninth annual meeting of the Material Handling Institute Inc.

Expected sales of $10 billion in 1955 rate the materials handling equipment industry near the top of the list of potential growth industries.

Stimulating Sleeper—Putting a still richer hue in the rose-colored glasses is the sales boost expected from use of the sum-of-years-digits system of depreciation, included in the 1954 tax law. This system has already won wide favor among industry accountants, though its technicalities preclude widespread public interest.

The sum-of-the-years-digits system allows depreciation of a greater share of equipment's value in the early years of use, thus more nearly approximating the real loss in value.

Official Word—New officers of MHI for 1955 are: President, R. H. Davies, vice president, Clark Equipment Co.'s Industrial Truck Division, Battle Creek, Mich.; First Vice President, George G. Raymond Jr., executive vice president, Raymond Corp., Greene, N. Y.; and Second Vice President C. H. Strauss, Ironbound Box & Lumber Co., Hillside, N. J.

R. H. DAVIES
. . . new president of MHI

Chrysler Corp.

A congressional committee looks at federally-owned tool leasing and says . . .

Let's Make Government Leasing Terms More Uniform

GOVERNMENT agencies concerned with leasing government-owned machine tools have been told to get together on terms. In some cases, terms have been dictated to them to eliminate inequities.

Doing the telling in this case is the Joint Congressional Committee on Defense Production.

Points of Repair—The JCCDP's 1954 annual report urges standard leasing rates and procedures for all machine tools supplied for defense work. It also calls for clarification of policy on government tools leased for nondefense work.

Present facility contracts are not always drawn up on the basis of fact, says the report. The contractor's estimated value of the tools required is frequently adopted by contracting officers. That tends to result in inequities. And the 1 per cent per month (40-hour week) rental usually charged in facility contracts is disadvantageous to the small subcontractor. The large contractor is able to use the tools on more than one contract.

Drawing Limits—Commerce department officials also have held that from several competitive angles it is unfair to industry for government-owned tools (except for a few extra-large elephant type) to remain in plants and be used on civilian production. Those officials would restrict elephant tools to units which have a purchase price of at least $100,000, those requiring 18 months or more to build or units where dismantling and moving would substantially damage the equipment. They feel the contractor should be required to sign a 5-year noncancelable contract to keep the equipment.

The government owns an estimated 400,000 to 450,000 machine tools or about one out every five tools in the country.

To One and All—"It is essential to our free enterprise," says the JCCDP report, "that government-owned equipment be made available to all contractors, large and small, on the same competitive basis." To this end "standard leasing rates and procedures (should) be established and applied uniformly by all responsible agencies . . ."

While the committee doesn't come right out and say it favors the Commerce department's proposal that government leasing rates be brought more in line with commercial rates, the inference is there. Commerce department officials have said the government leasing rate should be doubled at least.

The committee also said it believes in many cases contractors using government-owned tools enjoy distinct advantages costwise over the contractors having capital investments in their own tools.

By E. C. KREUTZBERG Washington Editor

ODM Recruits Key Policy-Makers

Some 250 to 300 top industry executives are needed. They will form the "Executive Reserve" responsible for control of the economy in event of another war

DON'T BELIEVE IT: the new "Executive Reserve" to be established by the Office of Defense Mobilization will not replace or duplicate the reservoir of executives being built up by the Commerce department's Business & Defense Services Administration. Your cooperation in furnishing key men on loan to the BDSA should be continued.

The two groups of reserves will complement each other. ODM men will man the policy-making agency or agencies that would control the economy in another war. BDSA graduates will administer and enforce their directives. This pattern is much like that employed during the Korean war. One group had top positions in the Defense Production Administration and wrote materials and production control directives that were implemented by another group in top posts in the National Production Authority.

Qualifications—The men being lined up by the ODM are selected on the basis of diversified experience to fill top and middle posts in deciding the use of materials, production facilities, manpower, transportation and communications facilities and in stabilizing prices and wages.

Three assistant administrators will be required, one for chemicals and rubber, one for forest products and a third for metals and minerals. They will direct the activities of 17 commodity divisions, such as organic chemicals, lumber and iron and steel, each of which will be headed by a director. This setup will serve under an administrator appointed by the President.

Who's Who — Altogether, ODM figures it will need 250 to 300 men from civilian industries to sit alongside government career men in the policy-making echelons. So far it has extended invitations to 32. Typical industrialists who have been tapped are R. D. Bradford, vice president, American Smelting & Refining Co.; H. L. Hall, manager, Production Planning Division, Aluminum Co. of America; Thomas R. Reid, director, Office of Civic Affairs, Ford Motor Co.

Labor leaders invited include such men as David J. McDonald, USW-CIO, and George Brown, AFL. As an example of economists invited, the first selection to date is Edwin George, director, Department of Economics, Dun & Bradstreet, Inc.

Training Plans—Men who accept invitations to join the ODM "Executive Reserve" won't get "lost in a ledger." They will receive training courses in Washington as soon as they have been cleared for security, also refresher courses at intervals. Not only will they be groomed for specific policy-making posts in war control agencies of the future, but they will be assigned tasks in the present planning phase.

The plan is to enroll them for a period of up to 20 years, with provision for replacement should they become unavailable for any cause. In the main, they will serve without government salary.

Future Hopes—The new reserve is to be created specifically for the ODM itself or for its successor organizations concerned with economic policy formulation. But ODM hopes its reserve idea will be copied by the various other departments and agencies that will have to recruit men from industry in time of war.

Notably, these are the Department of Defense, Department of the Interior, General Services Administration, Atomic Energy Commission, Interstate Commerce Commission and the Department of Labor. The ODM visualizes the eventual consolidation of all such personnel into a single "Executive Reserve" to be set up under a special act of Congress and conducted under a Presidential directive.

HOWARD J. MULLIN

BDSA Appointments Made

New director of the Iron & Steel Division, BDSA, is Howard J. Mullin, U.S. Steel Corp.'s manager of sales in the St. Louis district. Other BDSA appointments include: Russell C. Flom, Marathon Corp., Menasha, Wis., assistant administrator; Everett O. Clark, Vickers Inc., Detroit, director of General Industrial Equipment Division; and Raymond O. Bell, Allis-Chalmers Mfg. Co., West Allis, Wis., director of Electrical Equipment Division

Aid for Anthracite?

An unusual event for Washington was the three-day conference held this month by federal government officials and representatives of the anthracite coal industry.

Hard coal men told about new developments in automatic anthracite burning equipment, which, they said, make for greater economies in heating buildings. The outcome, it is expected, will be substantial orders for this fuel for heating federal buildings, particularly since there has been concern in the Eisenhower administration over the depressed condition in the anthracite industry in northeastern Pennsylvania.

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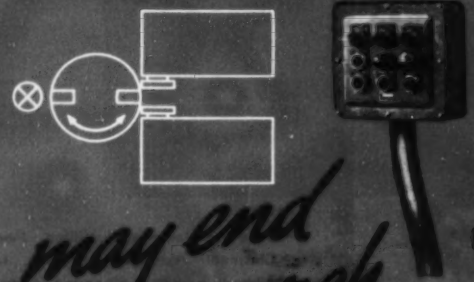

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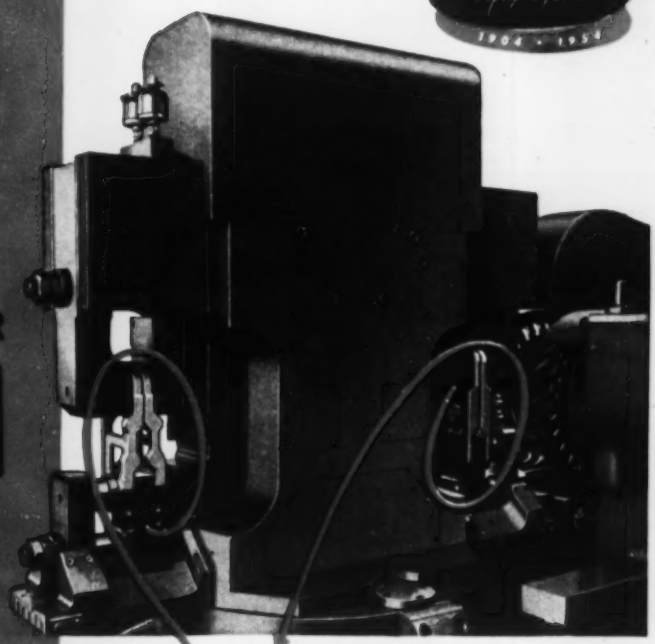
Fifty Years 1904 - 1954



Both sides of tractor side bars are face milled. Production is 240 pieces per hour using high speed steel cutters.

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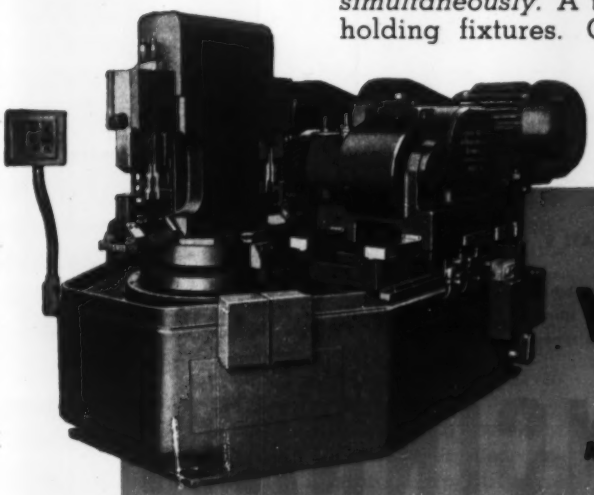
• Production milling is given new meaning by Motch & Merryweather's duplex method. Two heads mill two parts *simultaneously*. A table indexing 180° has two sets of work-holding fixtures. One operator unloads and loads during *duplex milling* at the opposite fixture. Fully automatic operation sets new production limits. Consult Motch & Merryweather about your production milling.



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Style 1B Toolmaster Milling Machine. Equipped with 1 hp spindle head; collet chuck type spindle nose, capacity ⅛" to 1" shank cutters; power feed to quill; worm positioning of swivel head.

CINCINNATI

Style 1B Toolmaster Milling Machine. Cincinnati rectangular overarm, square gibbed saddle-knee bearing, extra wide knee bearing on column face . . . these and other features constitute exceptionally sturdy construction for maximum hp cuts.

Meet the newest member of Cincinnati Milling's extensive line of machine tools . . . the Toolmaster. There are three styles of these sturdy toolroom milling machines:

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1C—Heavy duty spindle head

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Style 1C Toolmaster Milling Machine. Equipped with 2 hp heavy duty spindle head; built-in motor; 8 spindle speeds; No. 40 standard spindle nose.

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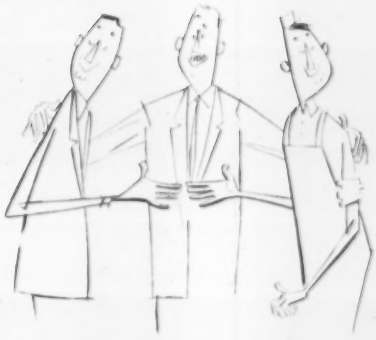


Atlantic's Lynch: People Are His Business

"WE DON'T think of ourselves as employees. We are the people of Atlantic Steel. The word employee draws a line between you and the company. When you say people, it's like saying you are the company."

That statement by an assistant roller and union grievance committeeman typifies the excellent relationship between management and workers at Atlantic Steel Co., Atlanta. It was not always so. As was true in many companies in the early forties, labor-management relations were poor. There were quickie strikes and slowdowns. Productivity per man-hour was low. Absenteeism, turnover and accident rates were high.

New Blood—Atlantic's board of directors in 1944 brought in Robert S. Lynch, then general superintendent of operations of the Central Alloy District of Republic Steel Corp. in Massillon, O. Starting as a laborer, Bob Lynch had worked on open hearths, blast furnaces and electric furnaces in Ohio and Pennsylvania. At Atlantic he rose from general superintendent to president in three years.

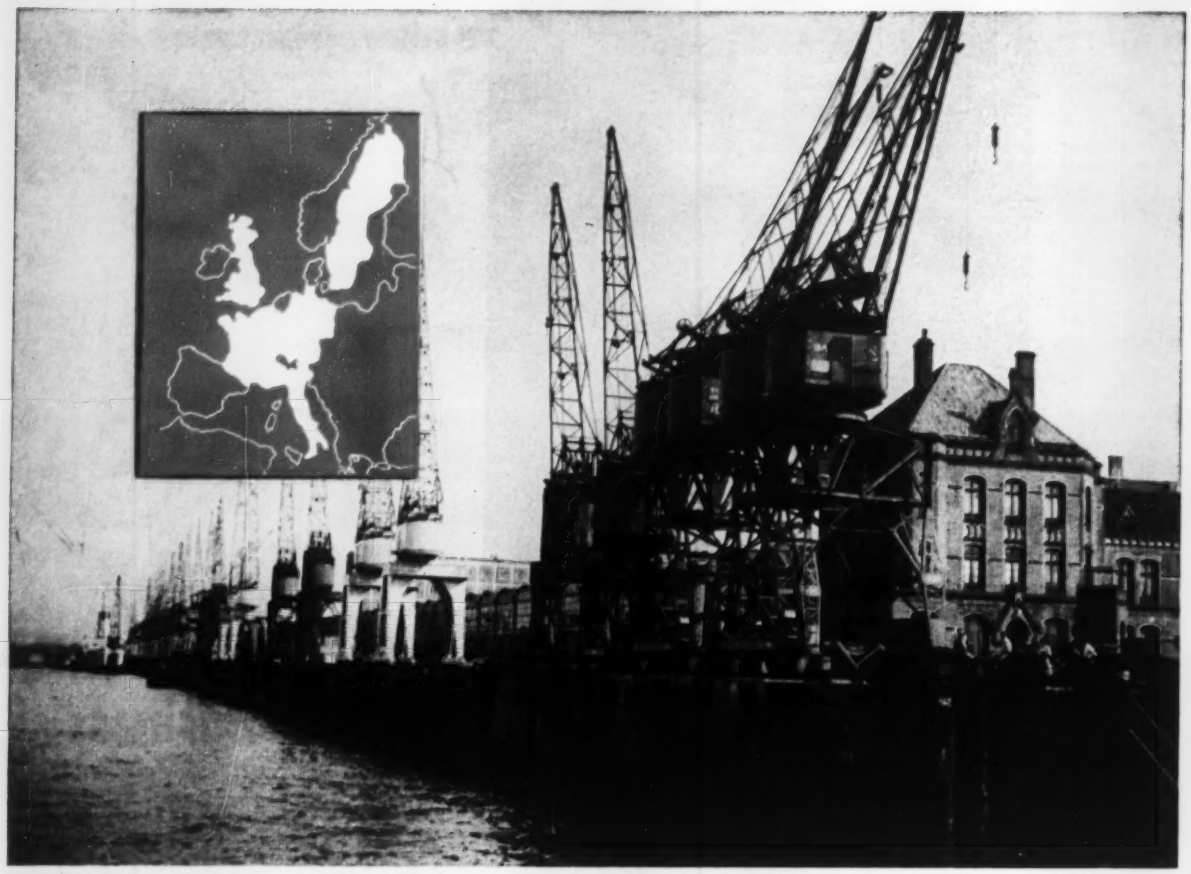
Bob Lynch immediately began working through the union (United Steelworkers), encouraging its participation in a broad program. He used it as a channel of communication. He set up accident prevention competition. He instituted training programs and conferences to impress on lower levels of management the importance of good industrial relations. Perhaps most important, he became acquainted with hundreds of Atlantic's 2000 workers—getting to know many on a first name basis.

The Results — Accident frequency declined from 15.28 in 1944 to 4.59. Average monthly turnover dropped from 12.02 in 1946 to 1.96. Unexcused absences dropped to 19 per cent of the 1946 figure. Productivity rose sharply.

So pronounced was the improvement that the National Planning Association chose the company as a subject for a case study on "The Causes for Industrial Peace" in 1953. NPA found that the change from bad to excellent occurred with such speed as to indicate a catalytic response. The catalyst was Robert S. Lynch.

Growing with the South—It would be entirely wrong to give an impression that Bob Lynch devotes all his time to industrial relations. He initiated a $6-million steel mill modernization program. This includes the Southeast's largest electric furnace—a 75-ton top-charge unit; establishment of a division with a 67,000-sq-ft warehouse, now being increased to 100,000 sq ft.

Noted for its wide diversification of products, the company serves the special needs of its area. As Mr. Lynch says: "This part of the country has made tremendous strides toward a stronger and better balanced economy. And I believe the progress to date has barely raised the curtain on our future potential."



All Western Europe is prospering as . . .

Germany and England Reach Postwar Peaks

GERMANY . . .

Steel output and metalworking activity are strong points in German economy

ANY DOUBTS about West Germany's economic recovery disappeared in 1954.

Prosperity and high level activity mark the whole economy. One of the most serious problems is finding enough skilled labor.

Big Three—Take the three indicators (steel output, industrial production and metalworking exports) for example.

Steel output will reach 18.9 million net tons, may even go as high as 19.3 or 19.4 million net tons in 1954. That's well over the 16,962,000 net tons output in 1953 and the 17,386,600 net tons in 1952.

Knocking on the Roof—Industrial production index (1936 = 100) reached a record high of 185 in September, 1954, compared with 169 in September, 1953. The index of machinery production jumped to 201 during the first nine months of 1954 as against 185 for the same period in 1953. The motor vehicle production index reached 262 for the first three quarters, 1954, compared with 202 over the like period of 1953.

Exports of German pig iron and steel products increased a little in 1954, despite the heavy domestic German demand. Total exports of steel products, which amounted to 2.3 million net tons for all of 1953, had reached 2.4 million net tons by September, 1954. Exports of machinery increased by about 30 per cent in 1954 over the preceding year and may bring sales worth $720 million this year.

One Way To Go — With such strong activity in 1954, what can German metalworking men look forward to in increasingly competitive 1955? Indications are that they expect an even better year.

Steel output is slated to reach 21-22 million net tons as the result of expansions in various plants already under way. There won't be much change in the German pattern of export trade. But a larger participation can be expected in such development projects as steel producing plants in Pakistan, India,

Egypt and Brazil; establishment of a tube mill in Canada; and dissemination of technical know-how to underdeveloped countries.

In Flux—Many German steelmen consider the European Coal & Steel Community as definitely weakened as a lever for European unification. Failure of the European Defense Community plans to gain acceptance are cited as contributing to the weakening. (On the other hand, Jean Monnet, in Washington, claimed the ECSC can be given some of the credit for the current high level of European prosperity.) Germans think ECSC may be transmuted into something like the pre-World War II European steel cartel and come to include British steel producers. In that case, there would still be quotas and price-fixing arrangements, but each of the member countries would retain full sovereignty over its own steel industry.

One problem not likely to be resolved quickly in 1955 is the skilled labor shortage. Germany, for all practical purposes, has full employment now. There are 850,000 persons registered as unemployed in the country. About half that number, however, are women who shouldn't be listed at all. Another quarter of that number are refugees from East Germany who quickly find jobs only to be replaced by more newcomers from the east.

Balancing Act — In 1955 West Germany will try to keep its place in competitive world trade, satisfy a built-up domestic demand for higher living standards, as well as re-equip a new German army.

ENGLAND . . .

Record steel output backs a record auto output. British expect new records in 1955

AUTOMOBILES, Britain's number one competitive weapon, cut a wide swath in world markets during 1954. Especially in dollar markets.

For the first time in the history of British automobile production, factories will turn out a million automobiles this year. Over a third will be exported.

Good Record—Despite stiff competition from the U.S., France, West Germany, Canada and Italy, British automakers are earning about $40 million in the U. S. this year and about $44 million in Canada. That makes the auto industry Britain's greatest source of foreign currency and its largest dollar earner.

Behind the booming activity in automobiles, the British steel industry is running at record rates. Output this year should top 20 million net tons or about 500,000 more than in 1953.

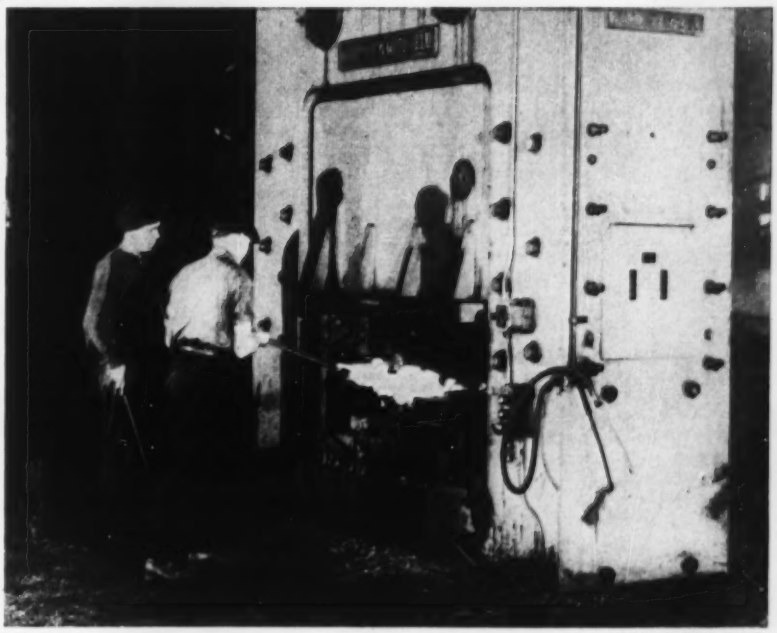
Going to Sea—The British shipbuilding industry, still the largest in the world, has cause for some concern, though it's the long-range kind. Shipbuilding production is reaching new highs in Britain as a result of increased steel production, but the rate of new orders is not replacing the tonnage being completed. Production is running at an annual rate of 1.5 million gross tons, while orders booked have dropped to 4,409,000 tons compared with 5,837,000 tons in 1953 and just over 7 million tons at 1952's peak. Even with the drop in backlog, there are enough orders on hand to keep British yards busy for about three years.

Despite increased output, British tin plate production cannot keep up with demand. So U. S. tin plate is being imported, duty free and price controlled, until Sept. 18, 1955.

A quick run down of other British metalworking industries reveals: Railroad rolling stock builders have full order books, with domestic British roads responsible for a considerable amount of work; agricultural machinery makers are fully employed—use of tractors in Britain has increased six times within the last ten years to a total of 300,000-plus units; machine tool builders are running at near-peak rates as the installation of new plant and equipment reaches postwar heights in Great Britain.

Full Ahead—There are no indications that British manufacturers intend pulling in their horns next year. Steelmakers are predicting another record production year of 21 or 22 million net tons in 1955. Exporters of steel products, which were limited by allocation, say they could have sold more goods overseas except for domestic demand. That situation may change in 1955.

HERE are two more articles in a series on the economic presents and futures of the major European countries. On Dec. 6 we wrote about Sweden and Italy, on Dec. 13 about France and Belgium. Next week we conclude the series with a summary of the Western Europe situation.



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A 600-ton British press removes flash from automotive forgings

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By FLOYD G. LAWRENCE *Detroit Editor*

Auto Trend: Better Suspension

Packard's torsion bar suspension and the influx of sports cars promise to make the public more suspension-conscious. Still a problem is cost

DETROIT

AUTO engineers stand in virtual agreement that a new emphasis on suspension is shaping up. Some believe it may even be the successor to the horsepower race, though the unfamiliarity of the average car owner with such matters makes suspension of questionable advertising potency.

Two factors may help to make the public more suspension-conscious, however. The first is the influx of sports cars. To the sports car enthusiast, suspension is a way of life, and it manifests itself in a capacity to take corners at about double the speed possible with standard American cars.

The other factor is the torsion bar suspension being announced on 1955 Packards. As described in this column last week, the torsion bars form an interconnection between front and rear wheels on either side of the car. They translate wheel movement into horizontal raising and lowering of the car body with virtual elimination of fore and aft pitch. That adds up to a ride remarkably superior to present systems.

Comfort Plus—Ride, most suspension experts agree, will be the primary objective in any future suspension development, and two elements of the Packard system should become universal. The first is the interconnection of front and rear wheels to eliminate pitch. The second is the use of a leveling device to compensate for the weight of passengers in the rear seat. To this must be added a probable third development, independent rear suspension, to reduce unsprung weight.

It should be pointed out that the Packard suspension has been kicking around the industry for a number of years. Most companies had a crack at it and rejected it because of its cost, which an engineer estimates in the neighborhood of $50 more per car than the conventional wishbone front and elliptic rear. But as competition stiffens, suspensions must soften. With its size and volume, Packard is suited to jump into the fore.

With Air—Interconnection of the front and rear wheels, however, can be accomplished by means other than torsion bars, and most engineers figure air suspension will be the ultimate industry standard. With air suspension, a jounce force received at any of the four wheels is transmitted equally to all wheels, causing the body of the vehicle to rise uniformly. The same distribution of air pressure accomplished through valving also would add at once the leveling feature without the cost of a heavy duty motor and switches to do the job as in the Packard installation.

Another by-product of this suspension is the possibility of varying the spring softness through changes in the amount of air pressure, which actually constitutes the spring. This would permit stiffening the suspension of the car for improved handling at high speeds

Five-Second 'Puff' Inflates Tubeless Tires at Ford

It used to take 75 seconds to inflate tire-and-tube combinations by the valve-stem method at Ford and Lincoln-Mercury assembly plants. But now that tubeless tires are standard on all Ford Motor Co. cars, the company does it in 5 seconds with new automatic inflation machines. The pushbutton-operated machines move the tire-and-wheel assembly upward against an air-tight bell and force 25 lb of air between the tire bead and rim of the wheel in one big "puff"

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on smooth roads. The system is analogous to the air lift used on the Lincolns in the Mexican Road Race for better handling.

May Lower Cars—Interconnected suspensions and leveling devices have another advantage to auto engineers that is not so readily apparent. Dissipation of the jounce force to more than one wheel reduces the amount of jounce travel each wheel must retain for a given degree of ride softness. Jounce travel, of course, is the movement of the wheel up into the fender or wheel well. Reduction of this travel space (particularly in the rear where passenger weight in the rear seat has been allowed for) will permit lowering cars two inches or more, with a consequent reduction in center of gravity.

Cited by one suspension expert are modern servos used in guided missiles which make them go straight regardless of deflective conditions. Possibilities which could be accomplished through valving coupled with servo units include making the car ride perfectly flat at all times or actually causing it to bank inward like an aircraft in the turns. Used in a suspension system in which air is the spring medium, with a hydraulic means of establishing the body position relative to the wheels, any other desired reaction characteristics could be built into the ride for a given condition.

Quick Change—Another possibility, if flat tires are still with us when all this comes about, is the jacking of wheels by raising the body up, inserting a strut, and lowering the body. Being supported, it will raise the wheel instead. Nifty, eh?

It should be emphasized that these same effects by and large can all be accomplished by torsion bars, air suspension or air-hydraulic suspension. Right now, however, air or air-hydraulic appear to have the inside track.

Soft Trend—Inescapable, however, is the coming of interconnected front and rear wheel suspension. Most engineers view the Packard suspension as analogous to the Chevrolet adoption of knee-action in 1934, with the subsequent swing to independent front suspension in the industry.

On the matter of independent suspension, one expert sees independent rear suspensions in the not-too-distant future. The basic advantage of this development used on such cars as the Porsche and Mercedes is in reducing unsprung weight, imparting a somewhat cat-like quality to the car.

Like Sand Bagging—The added sprung weight helps the ride of the car like sand bagging since it increases the inertia of the sprung mass. Because the unsprung mass is reduced, it means in effect that the wheels develop less hop on washboard surfaces, tend to return more quickly to the pavement under all bounce conditions. Their mass, hence inertia, is reduced.

Although engineers differ in their opinion on whether such an attribute will be appreciated by the average motorist enough to justify the cost, the passenger car of tomorrow promises to ride infinitely better than the car of today—thanks to interconnected front and rear wheel suspension. As a happy by-product, it promises to handle better, too.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,349	684,843
June	623,732	713,778
July	543,534	756,592
August	523,799	640,186
September	364,441	605,228
October	312,078	651,153
November	616,509†	458,567
December		529,588
Total		7,816,592

Week Ended	1954	1953
Nov. 13	141,154	115,748
Nov. 20	160,097	108,729
Nov. 27	134,858	74,290
Dec. 4	171,189	123,148
Dec. 11	173,790	113,145
Dec. 18	172,000*	132,093

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

Thunderbird—Handling Plus HP

Appropriate to a column on handling was a chance to live with the Ford Thunderbird for a few days. The car confirms original proving ground impressions (See STEEL, Nov. 8, p. 59) that it doesn't mull things over at a stoplight, and by varying air pressure in the tires, handling comes into its own.

Best differential for nice drifting seems to be a ratio of about 22 lb front to 32 lb rear, which imparts a moderate amount of oversteer to the otherwise understeering car. Understeer is a condition in cornering when the front end tends to resist deflection and added wheel angle is required to get the front end around the turn.

Sliding Turns—In an oversteering car, the condition preferred by most sports car enthusiasts, the rear end tends to swing outwards relative to the radius of the turning arc. This gives a vector of the driving force of the rear wheels, tending to push the car into the turn contrary to centrifugal force, thus permitting faster cornering. This method of cornering is a controlled skid or drift, which the suspension of tomorrow may make common to the passenger car.

But returning to the Thunderbird, the car not only digs and corners in impressive style but is also a livable mechanism. A trip in a wet snow storm was relatively comfortable, certainly comparable to conventional convertibles. The swept arc of the windshield wipers could certainly stand to be increased, however, particularly since the windshield is a considerable distance from the driver.

Summing Up—Steering wheel position is relatively low, and though some will prefer it, many will find leg clearance a problem. The seat cushion tends to extend a bit far forward, catching the driver just under the knees and cutting off circulation for the person of average height or less. The Ford see-thru speedometer continues to be a questionable blessing, and in the case of the Thunderbird, calibration up to 150 mph seems a waste of numbers. A top of 120 mph, with 130 mph indicated, seems about maximum.

Inspired by the Thunderbird, the Ford passenger cars continue to be nice machines. Good handling, acceleration and visibility keynote the 1955 offering along with color galore. Interiors are well appointed for the money.

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2. **Brick does not go through a liquid phase in forming its ceramic bond.**
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4. **MgO content is higher than in other end wall brick.**
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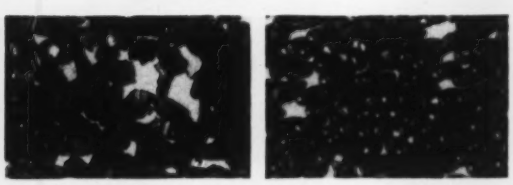
If you'd like to get a better finish than you've ever had before, faster and more economically—then be sure to try CUT STEEL. Send for samples, literature or a trial order—TODAY!



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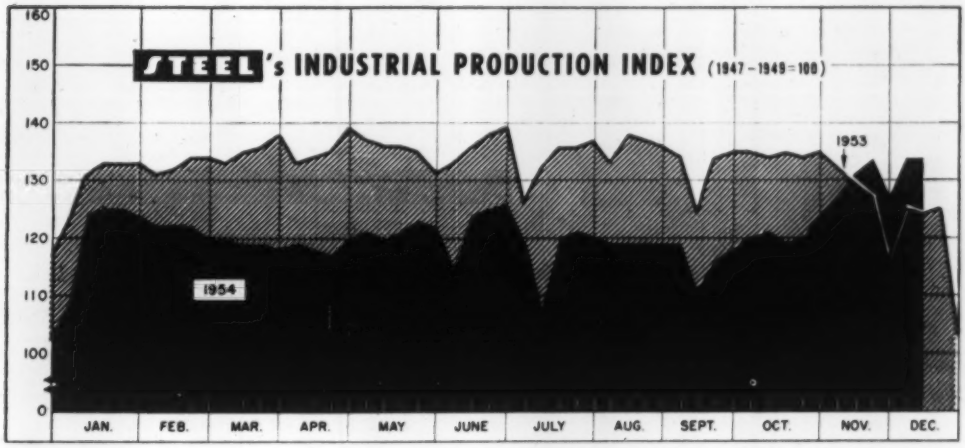

LATEST WEEK*	134
PREVIOUS WEEK	134
MONTH AGO	131
YEAR AGO	124

*Week ended Dec. 11.

†Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%.

Business Hikes Borrowing; Inventories Next?

ARE INVENTORIES on the way up? It's too early to say definitely, but some potent signs point that way.

Take commercial and industrial loans. Since the middle of November there has been a decided upswing. Loans in late November were running over $1 billion a week ahead of the same period of October.

Going Up—Some of that gain is directly attributable to Christmas buying, but such a steep rise indicates other than seasonal influences are involved. Borrowing for inventory build-up is one of the most likely.

Loans are still off sharply from 1953 levels. A low point hit in August, 1954, was the lowest since mid-1952. But since August, loans have been going up. If the rise continues, 1954 has a good chance to top 1952's $21.4 billion weekly average, but it will still be under 1953's $23 billion.

A Trend—In spite of the rise in auto industry inventories, metalworking generally is falling farther and farther behind its 1953 borrowing rate. Construction, as might be expected from its high activity, is running ahead of 1953. Petroleum, coal, chemicals and rubber are also on the plus side.

Inventory build-ups traditionally begin in commodities, then spread to manufactured products. For some weeks, commodity dealers have been among the heaviest borrowers, running well ahead of year-ago levels.

Protection—And other signs reinforce the chances of higher inventories in 1955. Some kinds of raw material are becoming hard to get on short notice; some protective buying is already in progress. Manufacturers' stocks in October grew by some $100 million, says the Commerce department's Office of Business Economics.

Most of that gain was made in durable goods stocks, which were helped by new car and parts stocks. Though the rise was no

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,944	1,958	1,900
Electric Power Distributed (million kwhr)	9,316[1]	9,612	8,661
Bitum. Coal Output (daily av.—1000 tons)	1,617	1,225	1,395
Petroleum Production (daily av.—1000 bbl)	6,275[1]	6,286	6,225
Construction Volume (ENR—millions)	$258.3	$302.8	$294.4
Automobile, Truck Output (Ward's—units)	173,790	171,189	113,145
TRADE			
Freight Car Loadings (unit—1000 cars)	636[1]	662	652
Business Failures (Dun & Bradstreet, no.)	213[1]	226	216
Currency in Circulation (millions)[3]	$30,697	$30,504	$30,904
Dept. Store Sales (changes from year ago)[3]	+1%	+2%	−2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,222	$17,870	$17,191
Federal Gross Debt. (billions)	$278.8	$278.9	$275.0
Bond Volume, NYSE (millions)	$27.3	$25.6	$14.9
Stocks Sales, NYSE (thousands of shares)	18,506	16,822	7,069
Loans and Investments (billions)[4]	$85.8	$85.9	$80.5
U. S. Gov't. Obligations Held (billions)[4]	$37.1	$37.4	$32.2
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	217.3	217.4	206.6
All Commodities[7]	109.3	109.5	110.1
Commodities Other Than Farm & Foods[7]	114.5	114.5	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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"LIFETIME" POLICY... See your doctor *every year* for a thorough check-up, no matter how well you feel.

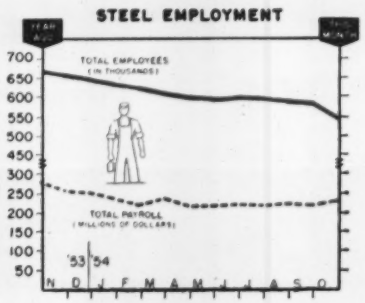
"DAY-TO-DAY" POLICY ...See your doctor *immediately* at the first sign of any one of the seven danger signals that *may* mean cancer (1) Any sore that does not heal (2) A lump or thickening in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.

Many cancers can be cured, but only if properly treated *before* they have begun to spread or "colonize" in other parts of the body.

For *any* information about cancer just call the American Cancer Society or write to "Cancer" in care of your local Post Office.

American Cancer Society

THE BUSINESS TREND



	Employment in Thousands		Payroll in Millions	
	1954	1953	1954	1953
Jan.	645	685	$251.3	$261.3
Feb.	636	685	236.6	261.3
Mar.	621	683	249.7	281.0
Apr.	609	685	232.6	278.0
May	606	685	234.4	281.0
June	609	690	236.4	282.1
July	608	696	232.8	288.1
Aug.	601	696	238.8	287.3
Sept.	597	688	234.6	283.8
Oct.	596	678	244.7	290.6
Nov.	...	667	....	268.5
Dec.	...	656	....	263.9

American Iron & Steel Institute.

Charts Copyright 1954 STEEL.

Production Workers—Five Major Groups In Thousands

1953	Prim. Mtls.	Fab. Prod.	Mach-inery	Elec. Mchy.	Trans. Equip.
Oct.	1,112	924	1,254	933	1,507
Nov.	1,068	902	1,240	913	1,449
Dec.	1,074	875	1,238	883	1,487
1954					
Jan.	1,049	874	1,230	855	1,470
Feb.	1,027	864	1,220	839	1,435
Mar.	1,010	852	1,202	827	1,409
Apr.	991	840	1,187	811	1,380
May	976	833	1,165	791	1,342
June	983	831	1,151	776	1,324
July	969	809	1,106	765	1,277
Aug.	969	819	1,097	783	1,237
Sept.*	964	818	1,096	797	1,171
Oct.*	961	818	1,090	807	1,256

*Preliminary.
U. S. Bureau of Labor Statistics.

more than seasonal, it's a good omen that durable goods industries, and metalworking in particular, are climbing up from their low rung on the ladder of recovery.

Improvement in Employment . . .

And just as the automotive industry is in a good measure responsible for rising inventories, so is it also helping the employment situation. Unemployment, which usually rises considerably about October showed relatively little change, and automotive and pre-Christmas hiring helped bring nonfarm employment to the year's highest level.

There was some seasonal unemployment among construction workers. But considerable numbers of men are being recalled to factory jobs, raising factory employment to the highest point since March. Small gains in electrical machinery, primary metals and fabricated metals supplemented large auto gains. Reduction of the number of long-term unemployeds (those seeking jobs 15 weeks or longer) is particularly encouraging.

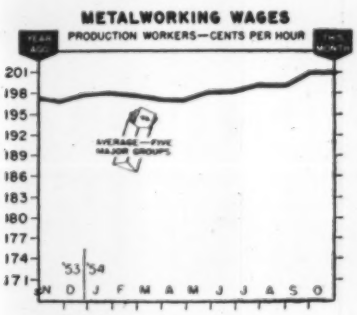
A longer factory work week also reflected the improved job situation. For manufacturing as a whole, average weekly hours rose from 39.9 to 40.1 in November, reaching the 1953 level the first time this year, says the Labor department. Longer hours boosted the average weekly pay of production workers to $72.98, a new high level. Besides automotive, 12 other major industries report longer workweeks.

Custom-built Trucks Speed on . . .

With many companies still counting fingers and toes to make sure they are still whole after the 1954 shakeout, the report of the truck body and equipment industry is quite a contrast. A survey of the industry's members by the Truck Body & Equipment Association Inc. shows that, in general, 1954 was up to 25 per cent better than 1953.

Employment is up; plant is expanded. Reflecting changing marketing conditions, sales outlets and personnel are up 27 per cent.

Most firms are entering 1955 with a backlog of 1 to 2 months and are optimistic for the coming year. Contrary to conditions in other places, there is a substantial government and defense backlog and continued prospects for new orders. Special military truck bod-

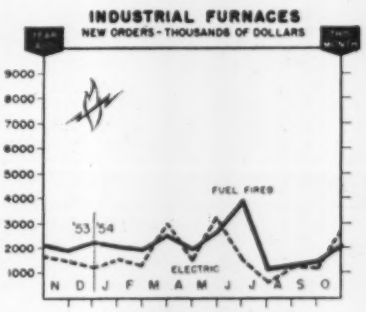


Production Workers—Five Major Groups

(cents per hour)

	Prim. Mtls.	Fab. Prod.	Mach. inery	Elec. Mchy.	Trans. Equip.
1953					
Oct.	208	187	199	178	210
Nov.	208	187	199	179	210
Dec.	208	188	201	180	211
1954					
Jan.	208	189	200	180	212
Feb.	206	188	200	181	211
Mar.	206	188	200	180	210
Apr.	205	188	200	180	211
May	207	189	201	181	211
June	208	189	201	182	212
July	211	189	201	182	212
Aug.	210	189	202	181	213
Sept.*	213	190	203	182	215
Oct.*	213	191	203	183	216

*Preliminary.
U. S. Bureau of Labor Statistics.



New Orders—Thousands of Dollars

	Fuel Fired* 1954	Fuel Fired* 1953	Electric 1954	Electric 1953
Jan.	1,865	3,540	1,374	1,655
Feb.	1,758	3,996	1,093	1,672
Mar.	2,346	3,607	2,828	1,301
Apr.	1,734	3,017	1,262	1,796
May	2,423	2,609	3,065	1,799
June	3,724	2,550	1,261	2,095
July	987	2,017	456	2,246
Aug.	1,117	5,465	1,052	1,904
Sept. ...	1,241	3,019	1,007	873
Oct.	1,950	1,975	2,496	1,539
Nov.	....	1,692	....	1,256
Dec.	....	2,013	....	1,014

*Except for hot rolling steel.
Industrial Heating Equipment Assn. Inc.

ies to transport new items of equipment are swelling order totals. On the civilian front, delivery truck bodies are viewed as a particularly fertile field.

High tensile steel is still the favorite fabricating material in spite of increasing use of aluminum and keen interest in fiber glass. But steel may lose more ground unless it ups sales promotion efforts to offset the job being done by aluminum and plastics boosters.

Auto Inventories Rise . . .

High auto production is sending inventories of new cars upward. About 350,000 are estimated in stock, compared with the 2-year low of 250,000 reported at the end of October. Chevrolet, Ford and Plymouth are pacing the industry, garnering about 60 per cent of production over the past month and a half. Those three are expected by *Ward's Automotive Reports* to end the year with about 58.2 per cent of total U. S. output in 1954. In 1953 they had 54.2 per cent.

Chevvy looks like the winner in this year's production-sales race. They expect to have a 10,800 lead over Ford by year end. At mid-year they had a similar lead.

January and first-quarter sales are expected to be boosted by introduction of new Nash, Hudson, Kaiser, Willys, Packard and some wrap-around windshield Studebaker models. Oldsmobile, Buick and Mercury are adding new body styles.

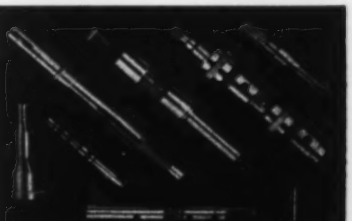
Trends Fore and Aft . . .

Heavy construction awards of $1215 million in November were 12 per cent higher than the previous record for the month set in 1952 . . . Electrical production racked up an all-time record of 9612 million kilowatt-hours in the week ended Dec. 4, according to Edison Electric Institute; colder weather and increases in steel and auto production sparked the rise . . . Pace of order backlogs remains much improved over the first 8 months of the year, says the Business Survey Committee of the Purchasing Agents Association of Chicago. Steady volume and profits are in prospect . . . Spot check by Commerce department shows a healthy percentage of retailers expect Christmas sales to top last year's; the first 6 months of 1955 also look good . . . TV sales in first 10 months are highest on record, reports the Radio-Electronics-Television Manufacturers Association.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866
THE WHELAND COMPANY
CHATTANOOGA 2, TENN.



Your machining department for hardened and precision ground screw machine products. Send for brochure & equipment list.

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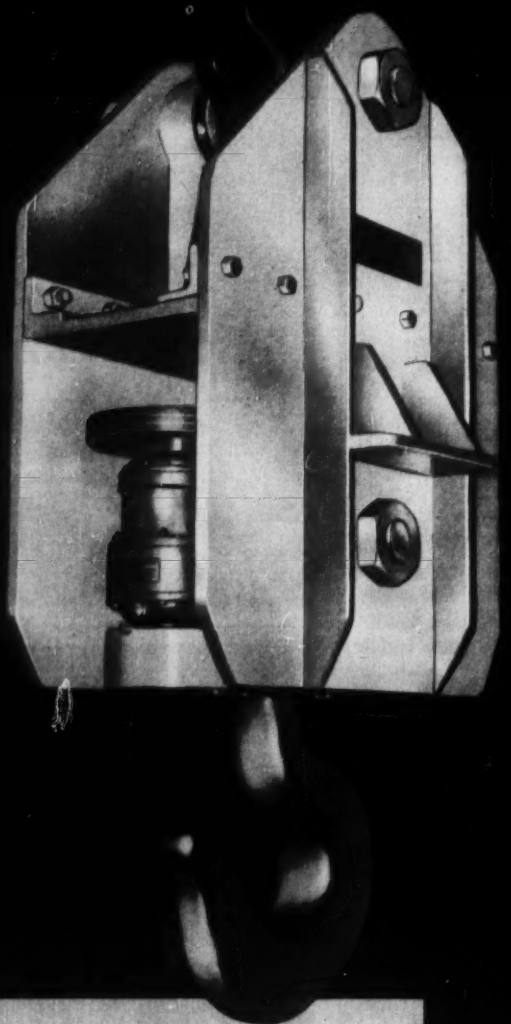
STEEL PRODUCTS INC.
Grand Haven Michigan

another step in . . .

PRODUCTIVITY

the Motorized Rotating Crane Hook

by



. . . Here is the latest development in the Heppenstall line of Tongs. It is the new motorized rotating crane hook designed by Heppenstall Engineers for use with existing crane blocks and hooks.

Features of this new Crane Hook are:

1. Turns all sorts of loads such as: coils, sheets, rolls.
2. Hook rotates a full 360 degrees in either direction.
3. All operations of the Heppenstall Motorized Rotating Crane Hook are controlled by the craneman from his cab.
4. A load cell can be incorporated with the hook recording weight of each load as it is lifted.
5. Capacities for largest industrial cranes.

Used with a "C" hook, the Heppenstall Motorized Rotating Crane Hook permits a coil of steel to be turned horizontally as it is lifted.

Electric motor furnishes power for turning the hook. Motor can be supplied to meet your current characteristics.

HEPPENSTALL

. . . tongs for every lifting problem

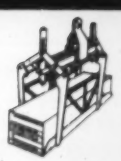
Write for complete information. Heppenstall Engineers will be pleased to help you adapt this new Heppenstall Motorized Rotating Crane Hook to your production requirements.

Send for this new catalog. It provides you with the solution to many lifting problems. Address: Heppenstall Company, Pittsburgh 1, Pa.

Tongs to lift Coil Horizontal around O.D.

Horizontal Coil Tong over ends

Tongs for lifting groups of rounds



Sheet lifter

ALFRED A. BOYLE
. . . Laclede Steel v. p.-operations

HUBERT RICHTER
. . . White Metal Mfg. president

JOHN C. TOOKER
. . . to head Reo Motors Inc.

Laclede Steel Co., St. Louis, elected **Alfred A. Boyle** vice president in charge of operations. He has been in the company's mechanical and operating departments for the last years and has been serving as general superintendent in charge of all company operations. Mr. Boyle succeeds to the office vacated several years ago with retirement of **John W. Gething.** He continues headquarters in the Alton, Ill., Works of the company.

William D. Jamison Jr. joined the engineering staff of **Guibert Steel Co.**, Pittsburgh, as chief engineer.

Le Roi Division of Westinghouse Air Brake Co. in Milwaukee named **Don S. Permar** to the newly created post of field sales manager. He formerly served as sales manager, stationary air compressors.

Howard M. Givens Jr. and **William G. Hassel** were appointed assistant general managers of sales, **Crucible Steel Co. of America**, Pittsburgh. **William B. Downes** was appointed assistant manager, stainless sales.

General Motors Corp.'s **New Departure Division**, Bristol, Conn., promoted **Louis C. Freeman Jr.** from public relations director to bicycle products sales manager. **Henry L. Brophy** becomes public relations director.

Hubert Richter was elected president of **White Metal Mfg. Co.**, Hoboken, N. J. He succeeds **Stanley M. Rumbough Sr.**, now chairman of the board. Mr. Richter was vice president-treasurer.

Benton J. Willner, former assistant general sales manager, **Inland Steel Co.**, Chicago, was appointed to the newly created position of assistant to the sales vice president. **Robert M. Buddington**, also an assistant general sales manager, was named general manager of sales. **John G. Mack Jr.** was made assistant to the general sales manager.

Charles A. Watson was appointed general sales manager, **Willys Motors Inc.**, Toledo, O. He has been vice president-sales, Willys-Overland Export Corp., and continues as an officer of that subsidiary.

John W. Belanger was elected executive vice president of **General Electric Co.**, Schenectady, N. Y., with supervision of general products and lamp facilities in Rhode Island.

Otto F. Sieder was elected to the newly created post of vice chairman of the board of **H. K. Ferguson Co.**, Cleveland. **Wells N. Thompson**, vice president and manager of the firm's New York office, succeeds Mr. Sieder as president.

John C. Tooker was elected president of **Reo Motors Inc.**, Lansing, Mich., purchased in November by Bohn Aluminum & Brass Corp.—transfer of ownership is scheduled to be completed on Dec. 31, when Reo will be operated as a subsidiary of Bohn Aluminum. Mr. Tooker, who had been vice president and assistant to the president at Reo, will succeed **Joseph S. Sherer Jr.**

Carl J. Oxford, former chief engineer and a director, **National Twist Drill & Tool Co.**, Rochester, Mich., was elected vice president in charge of engineering.

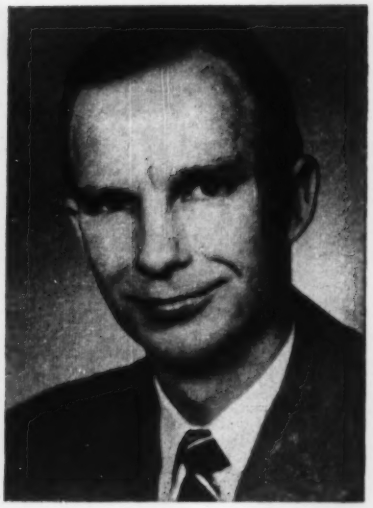
Spencer H. Mieras and **Kenneth W. Foust** were elected to fill vacancies on the board of **Bonney Forge & Tool Works**, Allentown, Pa. In addition, Mr. Mieras was elected executive vice president.

James P. Wiley was appointed division superintendent, maintenance, National Works, **National Tube Division**, McKeesport, Pa., for U. S. Steel Corp.

Charles F. McElwain was made director of defense engineering and defense manufacturing for **International Business Machines Corp.**, New York. **W. Homer Jennings**, at Detroit, and **LeRoy P. Stanton**, at Los Angeles, were made special representatives in the corporation's electronic data

HERBERT G. DILLON
. . . Mead-Morrison Div. sales mgr.

TRUMAN JONES
. . . DeWalt gen. sales manager



ROBERT H. KELLY
. . . Youngstown Sheet & Tube purchasing

processing machines department.

McKiernan-Terry Corp., Harrison and Dover, N. J., appointed **Herbert G. Dillon** sales manager of its **Mead-Morrison Division.** In charge of sales of the firm's materials handling equipment, he recently engaged in similar work at Heyl & Patterson Inc., where he was vice president in charge of sales.

David F. Canavan, purchasing agent, **Tyler Refrigeration Corp.,** Cobleskill, N. Y., was promoted to general manager of the firm.

Alexander Kidd, former vice president, M. W. Kellogg Co., was elected a vice president of **Stewart-Warner Corp.,** Chicago.

Harold Reagan was made plant manager, **Electro Metallurgical Co.,** Niagara Falls, N. Y. He succeeds **G. Leslie Lardie,** retired.

Donald B. Kendall was made manager, development engineering department, **Toledo Scale Co.,** Toledo, O.

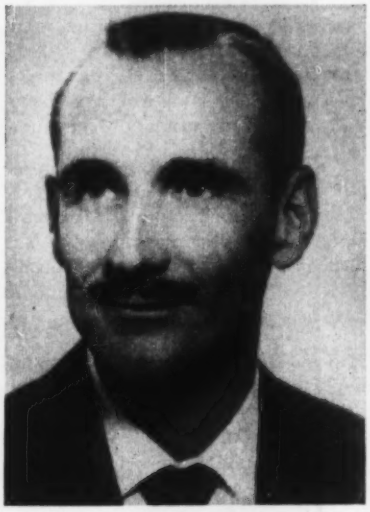
Henry J. Nave, director of service, **White Motor Co.,** Cleveland, was elected president of White Motor Co. of Canada Ltd., a subsidiary. He succeeds **L. M. Hart,** who continues as a director. **Karl A. Roesch** was named to succeed Mr. Nave.

Jack T. Teague was named engineering manager of **Randolph Bros. Inc.,** Glendale, Calif.

Truman Jones, former manager of the special sales division, was named general sales manager of **DeWalt Inc.,** Lancaster, Pa. He succeeds **Conde Hamlin,** elected executive vice president of De Walt, a subsidiary of American Machine & Foundry Co.

Oliver P. Swope Jr. was made vice president-operations, **Geo. F. Alger Co.,** Detroit.

Ralph W. Moss was appointed sales manager, **Haskel Engineering & Supply Co.,** Glendale, Calif. In addition, he continues as vice president and sales manager of Haskel Seals Inc.



RALPH W. MOSS
. . . Haskel Engineering sales mgr.

Robert H. Kelly succeeds **Walter F. Klump,** retired, in the Chicago purchasing department of **Youngstown Sheet & Tube Co.** With the title of assistant purchasing agent, Mr. Kelly will be in charge of the Chicago purchasing office.

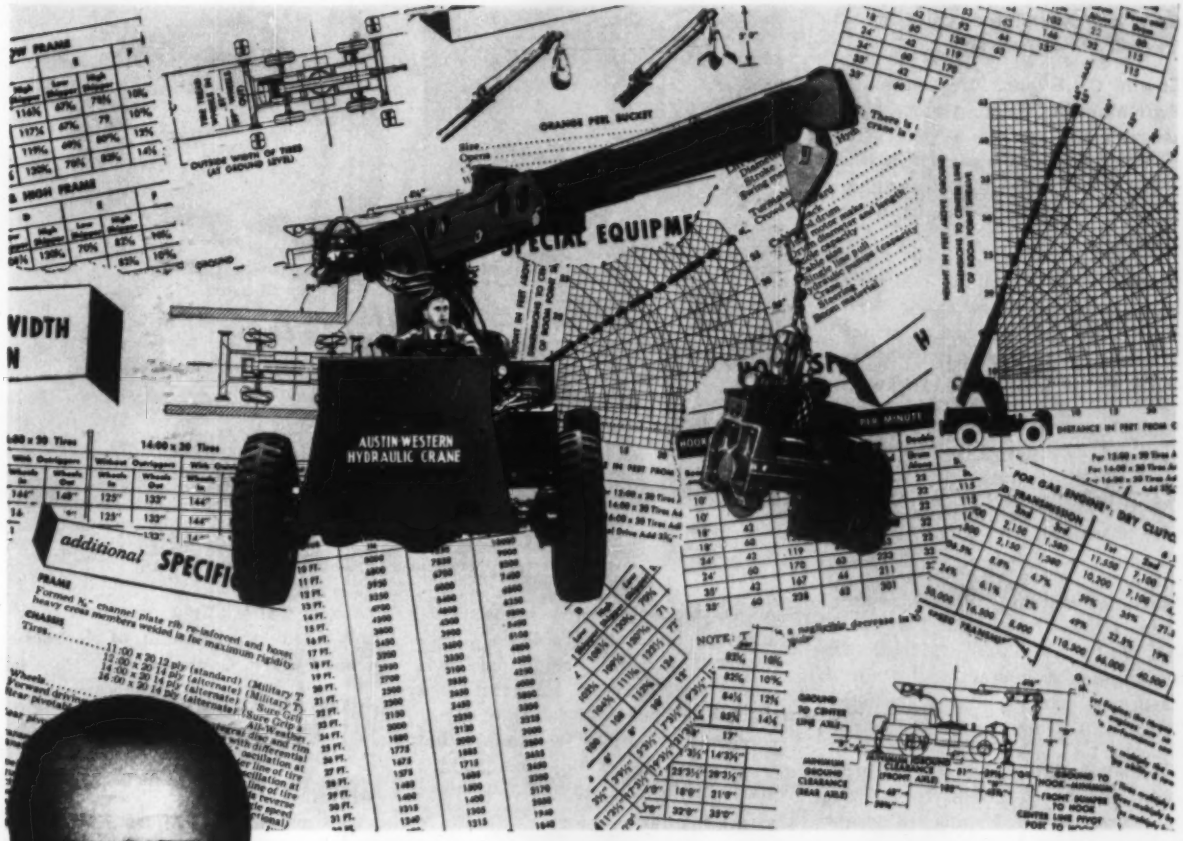
Link-Belt Co. named **William J. Brinkworth** to the newly created post of manager of oil field sales, with headquarters at its Ewart plant in Indianapolis. He formerly was at Houston as head of the firm's oil field distributor sales, and is succeeded by **James G. Samuell.**

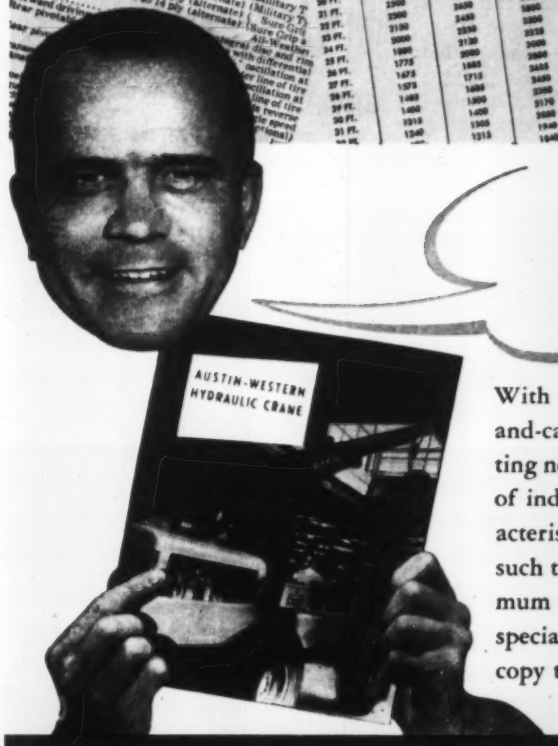
V. Lloyd Smith was made chief engineer, **Fort Pitt Bridge Works,** Pittsburgh. He succeeds **A. V. Dolan,** resigned because of ill health.

Ralph B. Billingham Jr. was made sales manager, automation section, **W. F. & John Barnes Co.,** Rockford, Ill.

George J. Neumann, vice president, **Lehigh Structural Steel Co.,** Allentown, Pa., was appointed plant manager to succeed **William H. Mohr,** who continues in a consulting capacity and as a director. Mr. Mohr was one of the founders of the company in 1919.

Robert W. Lester, former vice president, California Alloy Products Co., was made chief engineer of **Superweld Corp.,** North Hollywood, Calif. **Hoyt H. Todd,** former chief metallurgist of Kobe





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Inc., was appointed chief metallurgist at Superweld.

Edwin C. Evans, vice president, **Behr-Manning Corp.,** Albany, N. Y., assumes the additional post of assistant general manager. **William I. Clark Jr.,** secretary, was named to serve also as assistant to the president.

Frederick F. Franklin was made Cleveland district manager, **Vanadium Corp. of America.** Formerly assistant district manager, he succeeds **Paul H. Shaeffer,** retired.

Alan Parry was promoted to manager of the San Leandro, Calif., operations of **Caterpillar Tractor Co.** to succeed **W. O. Bates Jr.,** a vice president, who is retiring after 43 years of service.

National Bearing Division, American Brake Shoe Co., appointed **J. Walter Wallace** Chicago district sales manager, and **Paul J. Bauman,** eastern sales manager, with headquarters at Pittsburgh.

Carl F. Hallauer was elected president, **Bausch & Lomb Optical Co.,** Rochester, N. Y., to succeed **Joseph F. Taylor,** now chairman.

Richard L. Quasey, a buyer in the contracting division of **Dravo Corp.,** Pittsburgh, was made assistant purchasing agent of the corporation.

S. Whitney Dickey was made assistant vice president, **Brake Shoe & Castings Division,** American Brake Shoe Co., New York. He was eastern district sales manager.

A. D. MONCRIEFF

CLAYTON E. SCOTT

. . . Michigan Tool manufacturing manager and chief engineer

A. D. Moncrieff was made manager of **Michigan Tool Co.'s** machine tool and cutting tool divisions and **Clayton E. Scott** was made chief engineer for the Detroit company. **Charles R. Staub,** chief engineer since 1936, was named staff consultant.

James E. Josendale, former vice president-treasurer, was elected president and general manager of **Wire Rope Corp. of America,** St. Joseph, Mo. He succeeds the late **J. P. Barclay Sr. J. P. Barclay Jr.** was elected executive vice president and treasurer.

Harnischfeger Corp. appointed **C. R. Strehler** sales representative in Michigan for its P&H Welding Equipment Division, Detroit.

Levin P. Handy was made San Diego, Calif., field engineer for the Anaheim Division of **Robertshaw-Fulton Controls Co.**

Alexander M. Laughlin was elected chairman of **Vocaline Co. of America Inc.,** Old Saybrook, Conn.

Abraham Krasnoff was elected vice president, **Micro Metallic Corp.,** a Pall Filtration Co. affiliate of Glen Cove, N. Y.

Eric Boehm was made manager of the north Chicago division of **Houdaille-Hershey Corp.,** and **Ray A. Sandberg** was made chief engineer.

Maurice Olsaver was made sales manager, **Aget Mfg. Co.,** Adrian, Mich. Sales operations were recently moved from Ann Arbor to the Adrian plant.

OBITUARIES . . .

Ralph L. Shannon, 58, manager of the metal industries department of **Diversey Corp.,** Chicago, died Dec. 4.

William J. Mohr, 41, Canadian sales manager for **Marion Power Shovel Co.,** died in Chicago Dec. 2.

Joseph M. Jardine, 67, founder and president, **Western Welding & Equipment Co. Inc.,** Chicago, died Dec. 4.

Henry Shapiro, 77, founder, **Henry Shapiro & Co.,** Wilkes-Barre, Pa., and a founder of the Institute of Scrap Iron & Steel, died Dec. 1.

Frank O'Neill, 91, formerly head of **O'Neill Machine Co.,** Toledo, O., died in Florida Nov. 30.

Walter Buchanan, 40, sales manager, **General Steel Warehouse Co. Inc.,** Chicago, died Dec. 1.

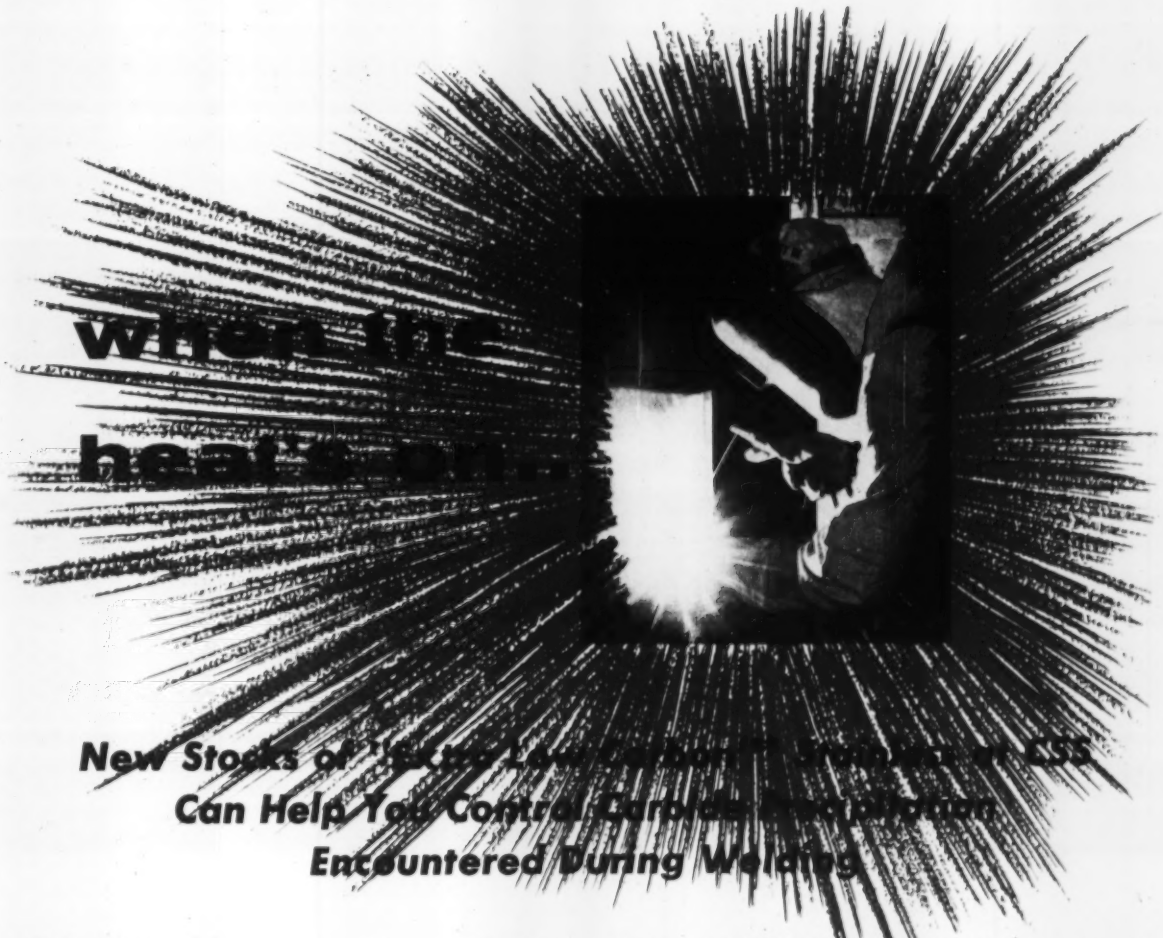
Harry O. Heller, for the last 20 years advertising manager, **Reed Roller Bit Co.,** died at his home in Houston Dec. 1.

V. Harvey Dieterich, 69, retired vice president, **Joseph T. Ryerson & Son Inc.,** Chicago, died at his winter home in Mesa, Ariz., Dec. 5.

Edward A. Breen, 43, manager of manufacturing engineering for **General Electric Co.'s** germanium products section, died Dec. 1 in Lyons, N. Y.

Fred F. Clark, 91, a founder of **Erie Foundry Co.,** Erie, Pa., and a vice president of the firm, died Dec. 3.

Ralph Lauder, 77, president, **Lauder Engineering Co.,** Reseda, Calif., died Nov. 30.



New Stocks of [illegible] Can Help You Control Carbide Precipitation Encountered During Welding

THE PROBLEM—During the welding of chrome-nickel stainless steels, a carbide precipitation range is set up. This range is located on both sides of the weld bead and is generally between the temperature of 800° and 1500° F. Holding the metal within this temperature range causes the carbon to be precipitated out of solution and be deposited along the grain boundaries as chromium carbides. The absence of chromium in this area leaves it vulnerable to intergranular corrosion. While annealing offers one solution to this problem, it has limitations because trouble spots are not always accessible.

THE SOLUTION—Metallurgists have found the most practical answer in the new low-carbon type 304ELC and 316ELC stainless plates and sheets, now in stock at the House of Stainless. These grades contain a maximum of 0.03 carbon which, when the material is welded, results in a very small amount of carbide precipitation. With this small amount of precipitated carbides, the metal retains sufficient chromium in solution to protect it from attack and to maintain its original corrosion resistance. Thus post-annealing and other corrective measures are eliminated.

**Type 304ELC and 316ELC (0.03 Max. Carbon) Stainless Steel Plates and Sheets*

Anticipating the demand for these special welding grades of stainless plates and sheets, Chicago Steel Service maintains complete stocks for immediate delivery. No matter what your needs for stainless steel may be, call LAfayette 3-7210. Warehouse deliveries or direct mill shipments.

The House of Stainless
STEEL AT YOUR SERVICE STEEL

CHICAGO STEEL SERVICE COMPANY

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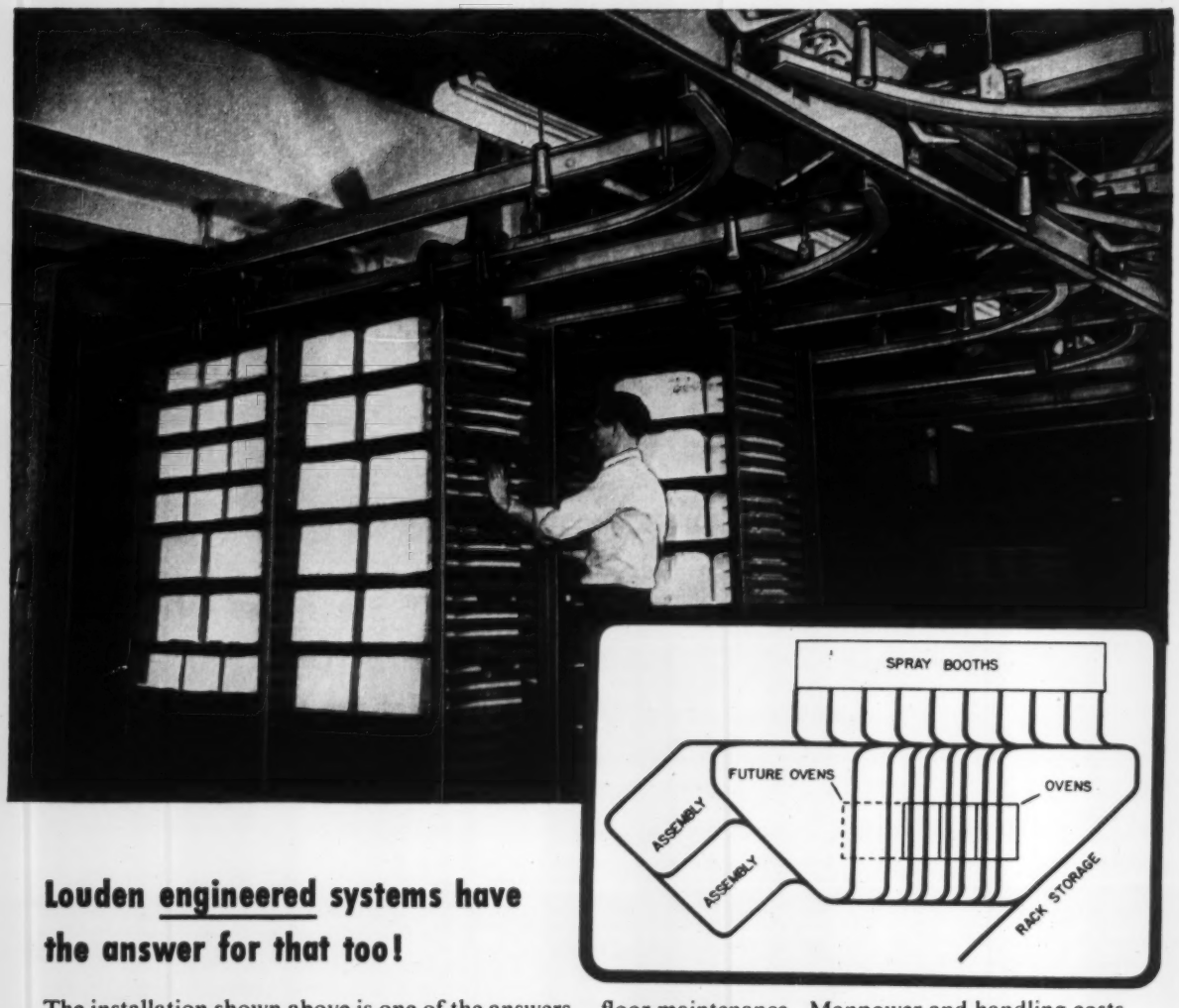
Milwaukee District Office: 757 North Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874

Minneapolis District Office: 3501 Hennepin Avenue, Minneapolis 8, Minn. Telephone COlfax 2602

Sales Representative at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Bettendorf, Iowa; Grand Rapids, Michigan; Appleton, Wisconsin.

Handling a broad range of shapes and sizes?



Louden engineered systems have the answer for that too!

The installation shown above is one of the answers Louden *engineered* overhead handling systems have for all handling problems. Here, a big enameling and japanning plant finishes everything from small parts to desks and cabinets. Louden monorail and man-powered conveyor racks handle work from dipping vats into baking furnaces on into storage. No unloading. No rehandling. No delays. No floor maintenance. Manpower and handling costs are cut, operations are accelerated.

You will find the lowest-cost, most efficient, most economical solution to your handling problems when you take advantage of Louden's long experience and competent engineering advice.

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Louden
MONORAILS AND CRANES

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Big Merger Proposed

Merritt-Chapman would buy three companies in broadly diversified fields

ACQUISITION by Merritt-Chapman & Scott Corp., New York, of New York Shipbuilding Corp., Camden, N. J.; Devoe & Reynolds Co. Inc., New York; and Tennessee Products & Chemical Corp., Nashville, Tenn., is proposed.

Plans were announced by Louis E. Wolfson, president and board chairman of Merritt-Chapman and board chairman of New York Shipbuilding and Devoe & Reynolds. Terms of separate offers have been approved by boards of all four companies involved.

The four companies have gross assets of more than $200 million and a net worth of about $129 million. Their gross revenues were more than $400 million in 1953.

Diversification — Merritt-Chapman & Scott, long active in the fields of construction, marine salvage and derrick heavy hoisting, has expanded and diversified its operations within the year by purchasing companies engaged in the production of steel and steel products, excavating equipment, power shovels and cranes, voting machines, electronic assemblies and television cabinets.

New York Shipbuilding Corp. operates a shipyard, fabricates heavy industrial equipment and machinery; through its Nesco Division, it produces electrical appliances, housewares and steel containers. The firm also holds a substantial interest in Highway Trailer Co. Inc., Edgerton, Wis., manufacturer of trailers and truck bodies, earth-boring machines and other equipment for public utilities.

Devoe & Reynolds Co. Inc. makes paints, resins, lacquers, enamels and related products. Tennessee Products & Chemical Corp. produces metallurgical and chemical products, fuels and building materials, using largely raw materials from its own mines and timberlands.

Fabricating Firm Organized

Delaware Valley Steel Works Inc., Wilmington, Del., has been organized to fabricate structural steel, metal tanks, hoppers and all types of weldments. Officers are: A. J. Seiler, president; A. M. Stevens, vice president and general manager; Roland C. Disney, vice president; J. M. Baxter, secretary and treasurer.

Porter Buys Riverside Metal

H. K. Porter Co. Inc., Pittsburgh, purchased Riverside Metal Co., Riverside, N. J., producer of nonferrous metals in sheet, strip, rod, wire, bar and circles. Riverside's Keystone Watch Case Division operates a factory producing watch cases, instrument parts and fuses for cartridges. Officers of Riverside Metal will be T. M. Evans, president; C. R. Dobson, vice president; F. A. Rehorst, secretary; and J. C. Leslie, treasurer. W. Harvey Thompson will be in charge of activities at Riverside.

Sheet Metal Firm Opens Plant

Goetti Bros. Metal Products Co. is operating its new steel beam and sheet metal plant at 2005 E. Indian School, Phoenix, Ariz. The company continues to operate its original plant at 714 S. Central, that city.

Somerville Foundry Expands

Somerville Foundry & Machine Co., Somerville, Mass., completed an addition to its factory. The additional 100,000 sq ft of space will be utilized for casting and fabrication of aluminum products.

Westinghouse Enlarges Plant

Westinghouse Electric Corp., Pittsburgh, is erecting a 67,000-sq-ft addition to its Air-Arm Division's plant in Baltimore, bringing total area to about 520,000 sq ft. D. M. Brown is manager of the division.

Michigan Broach Corp. Formed

Shatterproof Glass Corp., Detroit, completed sale of its subsidiary, Michigan Broach Co. The new company, Michigan Broach Corp., is operating at full capacity at its plant at 4285 Cabot Ave., Detroit. Direction of engineering and manufacturing of tools and fixtures is in the hands of Ronald Gee, Samuel Arvy and Alex MacKinnon.

Shooting the Breeze

Nine precisely calibrated air nozzles serve as a valve through which air is forced to build up pressure in a chamber. Then ducted through the traction motor or generator for the diesel electric locomotive on test, it simulates a wide range of service conditions. The research is conducted at General Electric Co.'s Erie, Pa., plant

Abbey Drum Co. Builds

Abbey Drum Co., Baltimore, is erecting a plant for the fabrication and reconditioning of metal containers. Nelson Newman is owner.

CF&I To Improve Soaking Pits

A modernization program that is expected to recoup its $90,000 cost within a year through quality improvements and production economies—that's what is scheduled for a series of 28-year-old ingot soaking pits at Colorado Fuel & Iron Corp.'s plant at Pueblo, Colo. The firm awarded a contract to Minneapolis-Honeywell Regulator Co.'s Industrial Division to engineer and install automatic control equipment for the old regenerative soaking pits. Officials say they expect pit life to be extended some 50 per cent.

John R. Green, Honeywell's steel industry manager, says automation of the steelmaking operation was handled by off-the-shelf con-

trol equipment and did not require costly electronic brains or "any other sophisticated components."

Garrett To Build Addition

George K. Garrett Co., Ellwood City, Pa., will build a 35,000-sq-ft addition to its plant. It will be equipped to handle steel sheets in the production of washers, hose clamps, springs, spacer and retainer rings for the automotive industry.

Federal Truck Resumes Output

Federal Motor Truck Co., Detroit, is again in operation. A Minneapolis group connected with Northwestern Auto Parts Co., primarily a truck parts exporter, purchased the physical assets of Federal, including its name, inventories, designs, tools, dies and other machinery. The newly organized firm is developing and testing pilot models for a line of units in the heavy-duty class.

Federal expects to expand output as rapidly as sales permit. The initial rate is 50 units per month. Officers are Max Rappaport, president; James Rappaport, secretary; M. J. McCarty, executive vice president; and Fred Rappaport, treasurer.

Babcock & Wilcox Buys Firm

Babcock & Wilcox Co., New York, purchased Globe Steel Tubes Co., Milwaukee, and will operate the property as part of its Tubular Products Division. The company had two plants in this division, six other plants in its Boiler Division, one in its Refractories Division. Other operating units include an Atomic Energy Division and a Research & Development Center. Globe Steel makes seamless and welded stainless, alloy and carbon steel tubing, plus aircraft tubing, pressure tubing and welding fittings.

Aluminum Fabricator Expands

Washington Aluminum Co. Inc., Arbutus, Md., fabricator of aluminum, is building an 8000-sq-ft plant addition, increasing total space to 53,000 sq ft.

Avco Unifies Sales Setup

Avco Mfg. Corp., New York, established a defense and industrial sales organization under the direction of H. Webster Crum, newly elected vice president, who reports to S. B. Withington, vice president. The firm plans to strengthen and expand its activities in electronics, power plants, airframe components, precision parts and weapons systems. It is extending its research and development plans to include the nuclear and guided missiles fields.

General Electric Reorganizes

General Electric Co., Schenectady, N. Y., made major changes in its organization at the executive office level. They include:

Formation of a Distribution Group, composed of the Apparatus Sales Division, General Electric Supply Co., International General Electric Co. and General Electric Credit Corp. The Affiliated & Foreign Companies Group is discontinued.

Henry V. Erben, executive vice president, was appointed as group executive in charge of the new Distribution Group; Robert Paxton, executive vice president, succeeds Mr. Erben as group executive in charge of the Apparatus Group. Canadian General Electric Co. becomes a part of the Apparatus Group.

John W. Belanger was elected executive vice president and was appointed group executive in charge of the Industrial Products & Lamp Group, succeeding Mr. Paxton. The X-ray Department becomes a part of this group.

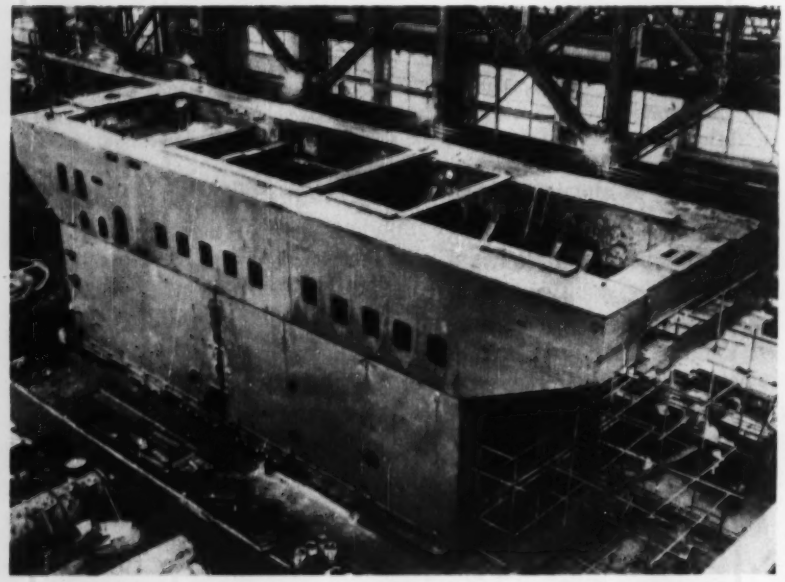
The name of Defense Products Group was changed to the Atomic Energy & Defense Products Group. Group executive responsibility was assigned to C. W. LaPierre, vice president, succeeding Mr. Belanger.

Trane Co. of Canada Expands

Trane Co. of Canada Ltd., Toronto, Ont., is constructing a $700,000 factory and office building. The project brings the firm's total floor area to 150,000 sq ft and will provide for increased production of air conditioners and refrigeration compressors.

Wesson Metal Builds Plant

Wesson Metal Corp. completed its 40,000-sq-ft cemented carbide metals plant at Lexington, Ky., and put it in full operation. James A. Fraser, president, says the firm has more than doubled its productive capacity and expanded its



Westinghouse Condenser "Doubles in Brass"

This 80,000-sq-ft condenser, shown under construction at South Philadelphia (Pa.) Works of Westinghouse Electric Corp., Pittsburgh, serves as the foundation for a turbine, as well as its normal function. It is 60 ft long, 24.5 ft wide, 14 ft high and weighs 1,365,000 lb. including its superstructure. It contains 5115 60-ft long 1-in. tubes, having a total length of nearly 60 miles

research and development facilities.

ASSOCIATIONS

Ted Operhall of Misco Precision Casting Co., Whitehall, Mich., was elected president of **Investment Casting Institute,** Chicago. V. S. Lazzara of Castings Engineers Inc., that city, was elected vice president, while Harry P. Dolan of Harry Dolan & Associates was reappointed executive secretary.

John Dingee joined **Can Manufacturers Institute,** New York, as general manager of its marketing bureau. He will work in close liaison with Harold H. Jaeger, director of the bureau.

Ernest Hartford retired as deputy secretary of **American Society of Mechanical Engineers,** New York. He will continue to serve the society in a consulting capacity.

Society of Industrial Packaging & Materials Handling Engineers, Chicago, established two new divisions: Southwestern, in Dallas, Central Pennsylvania, in Harrisburg.

Leslie Clifton Whitney, manager of development engineering, Wire & Cable Division, Copperweld Steel Co., Glassport, Pa., was elected president of **Wire Association,** Stamford, Conn.

J. S. Besser, manager of fuel sales, Colorado Fuel & Iron Corp., New York, was elected director of **National Coal Association,** Washington.

Gustav Metzman, president and chairman for the last two years of **American Railway Car Institute,** New York, resigned, effective Dec. 31. Mr. Metzman retired in 1952 as president of New York Central Railroad.

Chicago Foundrymen's Association re-elected Carl A. Larson president. He is a partner in Reliance Pattern Works, that city. Other officers are Joseph Vilbig, Fox Valley Foundry Co., Aurora, Ill., vice president; R. H. Lehmpuhl, Sheffield Foundry Co., Chicago, secretary-treasurer. Mildred Kosar continues as executive secretary.

Wayne Rising, vice president, Ducommum Metals & Supply Co., Los Angeles, was elected president of **National Association of Aluminum Distributors.**

William H. Kushnick was appointed executive director of **Instrument Society of America,** Pittsburgh. He was formerly director of the School of Management, American Management Association, New York.

Earle V. Grover, president, Apex Steel Corp. Ltd., Los Angeles, was elected president of **American Institute of Steel Construction Inc.,** New York.

NEW ADDRESSES

Guthery Machine Tool Corp. moved from Manhattan to 38-31 Crescent St., Long Island City 1, N. Y. The firm distributes Traub and Leinen precision screw machines and lathes, as well as domestic tool equipment.

Peerless Steel Co., dealer in surplus steel and nonferrous rolled products moved its offices to 1549 S. Michigan Ave., Chicago 5.

Charles Dreifus Co., scrap broker, moved its Philadelphia offices to 12 S. 12th St.

Merritt-Chapman & Scott Corp. established new executive offices at 261 Madison Ave., New York. Administrative headquarters will be there, while the firm's offices at 260 Madison Ave. will continue to serve as operational headquarters.

Air Force contractors and potential Air Force suppliers in the New York metropolitan area are being serviced from the new offices of **New York Air Procurement District** at 111 E. 16th St. The office has contractual, production and inspection control over Air Force contractors from Long Island to Fairfield county, Connecticut.

REPRESENTATIVES

Cochrane Corp., Philadelphia, appointed Turbine Equipment Co., Glen Falls, N. Y., as representative for its equipment, including deaerating heaters, continuous blowdown systems, valves, condensate drainage and return systems, water conditioning equipment, and a variety of steam specialties.

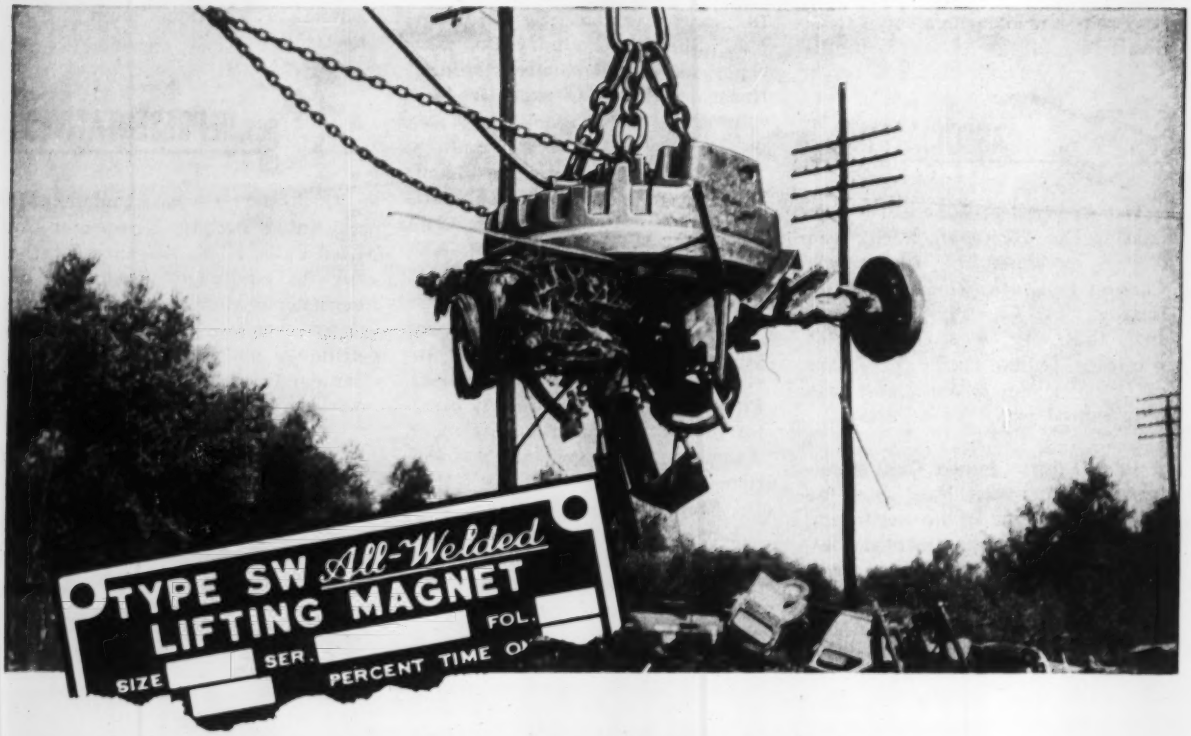
Leach Relay Co., a division of Leach Corp., Los Angeles, appointed two new representatives: L. M. Beier Co., Chicago, and B. S. Woodman Inc., Atlanta. The company makes relays, solenoids, packaged systems and pressure switches.

Mayfair Industries Inc., Chicago, appointed George E. Harris & Co. Inc., Wichita, Kans., as its representative. Harris maintains sales offices in St. Louis and Kansas City, Mo., Dallas and Ft. Worth, Tex. and Cedar Rapids, Iowa. Mayfair makes precision parts, connectors and forgings in stainless steel and titanium for the aircraft industry.

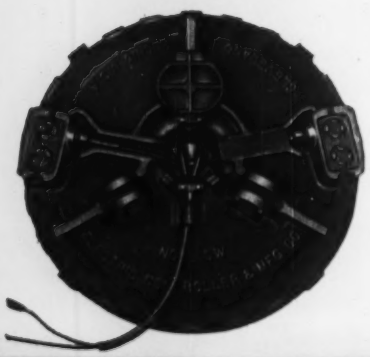
Roll Formed Products Co., Youngstown, appointed Harned McCallie Co., Chattanooga, Tenn., to handle its products in Georgia, Alabama, Tennessee and southern Kentucky. The firm's products include simple and complex shapes produced from carbon, galvanized and stainless steel; aluminum; copper; zinc; clad metals.

Harper Electric Furnace Corp., Buffalo, manufacturer of high temperature electric furnaces and kilns, appointed Amco Furnace Contractors Ltd., Toronto, Ont., as a distributor.

Logan Clay Products Co., Logan, O., appointed A. Lynn Thomas Co. Inc., Richmond, Va., George S. Edwards, Birmingham, and William Grant, Pasadena, Calif., distributors for its vitrified clay gutter and curbing product designed to handle highly-corrosive industrial wastes.



More Features of EC&M TYPE SW ALL-WELDED LIFTING MAGNETS Assure More Dollar Value



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EC&M Type SW ALL-WELDED Lifting Magnets have a new look . . . inside as well as outside. Stronger, better designed to withstand the hard knocks encountered in magnet operation, they are easier to maneuver, and through high lifting capacity they reduce handling costs.

The magnet-coil is wound between turns with purer, thinner asbestos tape, with its strength increased by impregnation with EC&M No. 281 compound. Between layers, the insulation is a new product—ECAMICA board which is moisture-free, has high dielectric strength and excellent mechanical ability. A new fabricating process locks the windings against movement.

Look at the features pictured here in the top and bottom views of the magnet. Remember, too, that these EC&M magnets are ALL-WELDED to keep pole shoes tight—to keep moisture out—to increase the efficiency of the magnetic circuit and to prolong magnet life.

write for bulletin 900

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

Technical Outlook

UPGRADED MOTORS— Operating temperatures at least 75 degrees higher than presently feasible will have little effect on motor insulation life, says the General Electric report on their new Alkanex thin-film insulation. Excellent in abrasion and solvent resistance, too, the new material showed no signs of deterioration after a six-months baking at 300°F. Called a giant milestone by GE researchers, its use could upgrade present motor horsepower ratings by 25 per cent without changing anything else in the design.

POWDER AND GRAIN— Equations for grain growth must be modified for sintering of metal powders. Powder metallurgy permits metals to be obtained with grain structures which are different from those in metals prepared by conventional methods, says Dr. Henry Hausner, a Sylvania engineer. Result is greater hardness and higher strength.

MARRIAGE— Metal powders and plastic go together to give a metal-like mass with many possible uses. One composition, 80 per cent steel powder and 20 per cent plastic, is a cold setting resin that looks like steel but impact strength is lower. Now used to make dies, jigs and fixtures it will also patch holes in castings and other things. It's called Devcon by Chemical Development Corp., which is backing it.

ELECTRONIC WATCHMAN— Developers of a new low cost electronic locking system say that it will safely replace all but one guard in any plant.

GOOD TO THE LAST INCH— Thermocouples used to translate heat of a steel melt into degrees fahrenheit are expensive—especially when they're equipped with platinum and rhodium wire. One type contains about 80 in. of platinum wire which sells for $1 an inch. At Timken, they've managed to get the last bit of use from couples by chopping off the end that's pitted after repeated use and moving out unexposed wire. After some 32 in. are used, the remaining short length is removed and butt welded to six or seven others to make a new couple assembly. The company figures it saves $5000 in the salvaging operation.

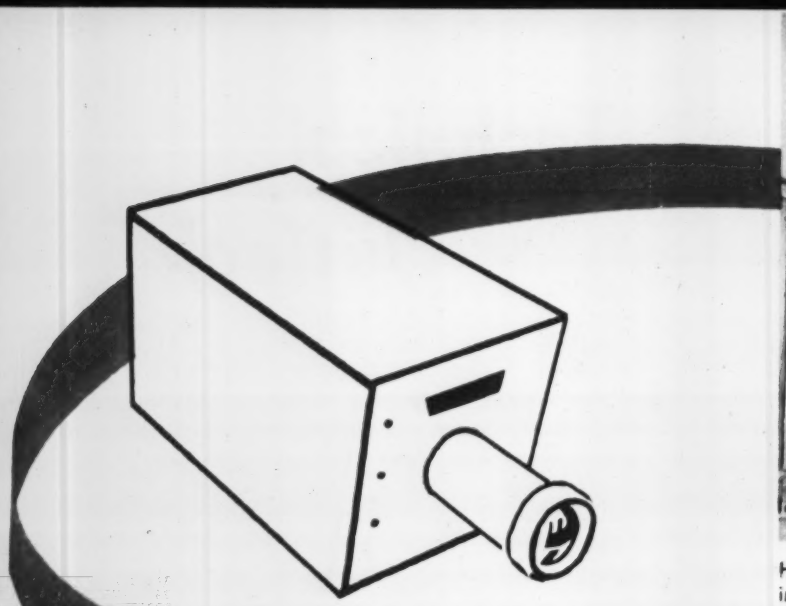
BETTER AIR— Control of spray from chromium baths has long been a platers' problem. A fluorochemical synthesized by Minnesota Mining and Mfg. Co. is being supplied by Udylite Corp. as an additive to chrome baths to cope with the problem. Called Zeromist, it's a surface active agent with high stability that cuts down mist above the plating solution to a low level.

DESULPHURIZED IRON— Finely divided calcium carbide injected into molten iron removes sulphur, permitting more economical alloy additions. A batch feeder worked up by Aircomatic blows the carbide under the surface of the iron with dry nitrogen pressure. The process looks applicable to a variety of alloying additives.

COLOR CROP— Time to reclaim foundry croppings is when they are made. Provide the burner with an array of paints so he can color code heads, gates, sprues and riders, says Blaw-Knox. That way, different heats and chemical analyses don't get mixed and it's easier to keep tab on what is going back into the furnace.

BETTER BEARINGS— There may be a clue to bearing performance in score resistance studies conducted by GM. The findings: "The only element metals that had satisfactory resistance against steel . . . were the B-subgroup metals that are immiscible with iron or form intermetallic compounds with iron."

Metalworking Outlook—p. 33 *Market Outlook—p. 109*



Here's the camera, encased in dust-proof housing, watching slabs being pushed into charg-

PROCESS CONTROL INSPECTION PLANT PROTECTION TRAFFIC CONTROL

Industrial Television: Brighter

The medium is about ready to expand its industrial audience. Along with technical refinements, suppliers are making progress in selling the technique

INDUSTRIAL TV, a post-war electronics baby, soon should command a profitable return for the handful of producers who conceived it. They figure there are about 500 closed circuit installations now. At least one, Thompson Products Co.'s Dage Division, is banking on a total market of something like 5000 a year eventually.

"Eventually" may be quite a while. But things are definitely looking up for future sales of this vision-extender.

Dimensions—Some tough problems had to be overcome before the medium could merit broad industrial appeal. One of the most important is size.

Models of at least three producers cut cameras down to about 9 x 6 x 4 in. Weighing in at about 10 lb, their monitors can be either standard TV receivers or more compact types designed for closed circuit use. One of the latter weighs only 40 lb and has a 14 in. screen. The camera operates on 40 w, the monitor, 150 w.

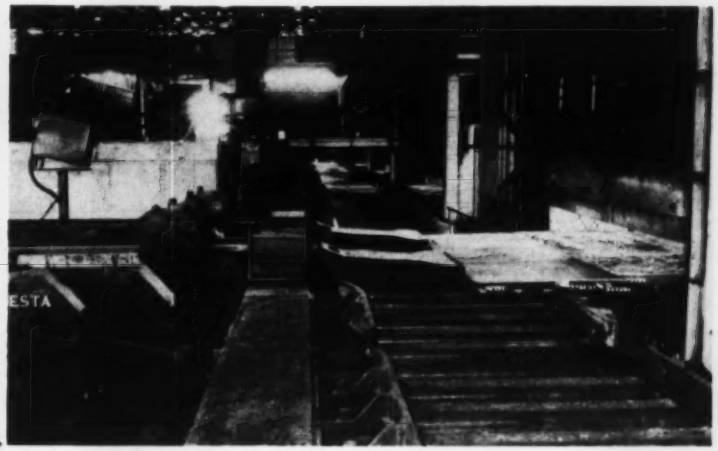
Size is significant. One of the unique selling points of ITC is its ability to observe at places where a man can't go. Cameras now are easily portable, too. Even larger models mount easily on a regular photographer's tripod. They can be mounted at any angle.

Cost—Of course, producing sets at a price customers can afford to pay has been tough. The producers have come a long way here, too. You can buy one of these smaller sets for about $1300—$900 for the camera, $400 for the monitor. Some of the larger sets are tagged in the neighborhood of $3000. Responsible for development of the smaller sets and lower prices are greatly simplified circuitry and, on some models, the elimination of separate power systems for the camera.

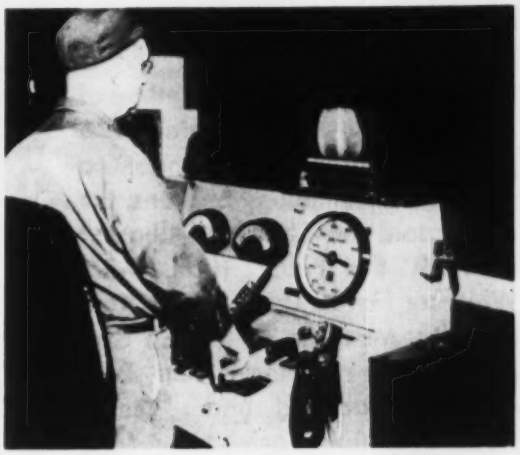
The biggest obstacle cost-wise still is the pickup tube in the camera. Two are available. RCA's Vidicon is the less expensive at $400 or almost half total camera cost. Diamond Power Specialty Corp. uses the Vidicon and also produces its own Image Rectifier under Farnsworth patent. Naturally, this little tube is the object of some intense research among both set producers and private groups. Average life of the Vidicon is calculated at about 1500 hours. The Image Rectifier lasts longer.

Specialized Equipment—Tacked onto base price on almost every set will be special equipment, and no installation is entirely standard. The specialty items up the price, but they make the prospects for sales more attractive because they make it possible to adapt sets to special operating conditions.

Available are such items as weatherproof, explosion-proof, underwater and water-cooled camera housings. You can also obtain switch gear for use with two or more cameras, an automatic iris control, turret lenses, water-cooled lenses, shock-proof mount-



ing end of reheat furnace at U. S. Steel's Fairless Works. At right is the control pulpit showing monitors that oversee the job



ITV guides an operator controlling progress of hot steel strip at U. S. Steel's Gary sheet and tin mill

DATA TRANSMISSION INSTRUCTION AND TRAINING

Picture Ahead

By WILLIAM R. WOLFE
Assistant Editor

Remote checking of freight car numbers is one of several TV functions demonstrated for railroads

ings and remote camera panning equipment.

In the installation at Babcock & Wilcox Co.'s Beaver Falls, Pa., plant they've mounted the camera with a long-focus lens in a special air-cooled enclosure to look down on molten metal flow in continuous billet casting. The process no longer requires a man to be stationed near the high mold heat to hand signal the operator. Instead, the operator sits at a control station about 60 ft away and watches over the pour on a monitor screen.

Now Color—Next to come will be color. The first marketed commercially is expected this month, although Dage has had an experimental model in operation and on exhibit for several months.

The metalworking market will be a tough one for color to crack. In the first place, the price starts at about $15,000. By the time you tack on optional equipment, this outlay can be run up to $30,000. There's also the problem of what to do with it: Few industrial observation or control jobs can be improved by using color instead of a simple black and white image.

Needed: Vision—The job of seeing and selling the application is the most critical facing firms promoting the still-unexploited medium. Industry will pay the price if the producers can spell out the advantages in dollars and cents.

In many instances, this shouldn't be too difficult. The steel companies have been responsible for some early installations that show off the medium to advantage.

At U. S. Steel Corp.'s Gary, Ind., sheet and tin mill, a camera is mounted in the rafters 48 ft above the block-long runout table. When hot-rolled strip moves at 2000 fpm over the rollers, the operator can observe the operation on a monitor and make needed adjustments in pressure on either side of the rollers.

In another U. S. Steel plant, an operator at the Fairless Works uses two monitors in charging slabs into a pair of reheating furnaces. Cameras are set up at the charging ends of each of these furnaces so the outside end of the charging line is in view. In this way, the operator in the pulpit can take care of alignment without extra men.

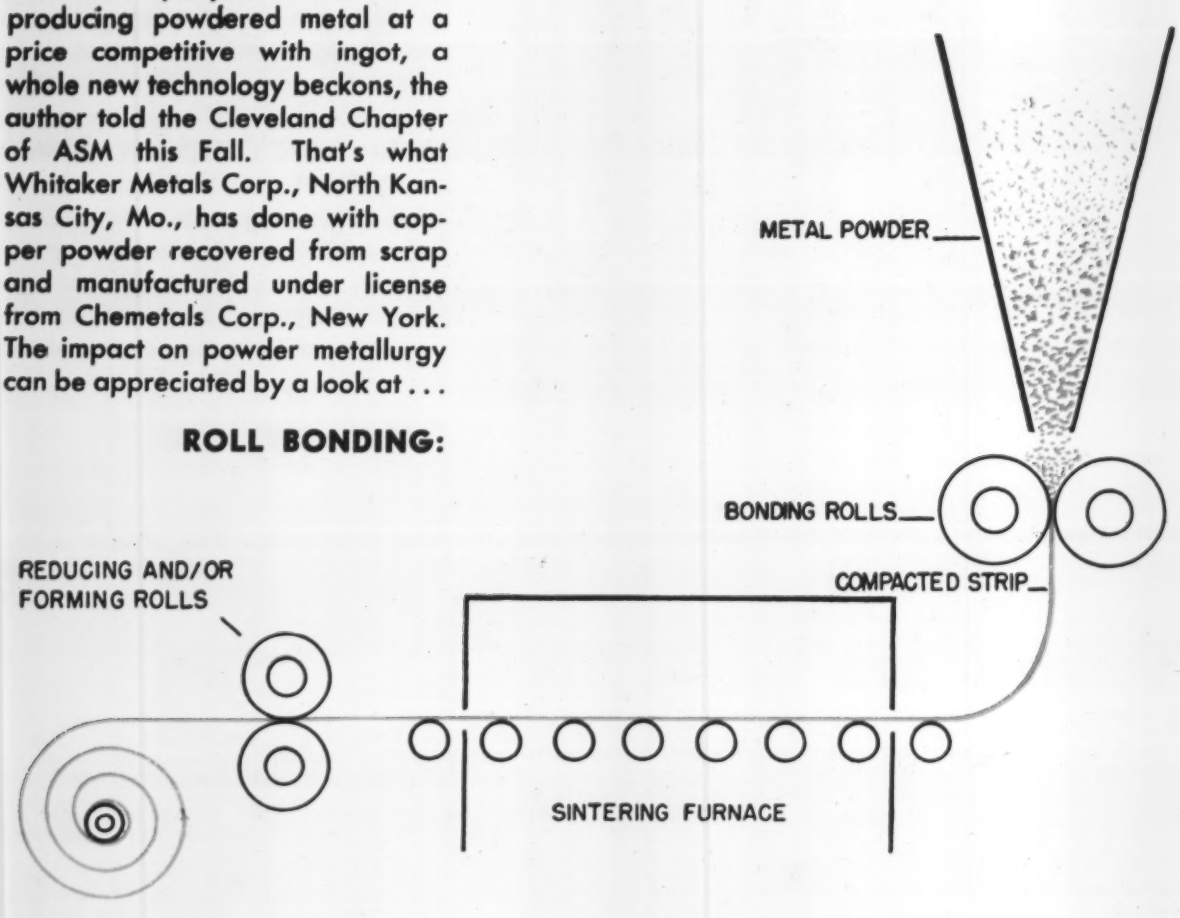
Railroads — The railroads have watched with interest demonstrations where ITV is used to check numbers on freight cars arriving at B & O's Barr Yard in Chicago. A yard office clerk simply records numbers from a monitor instead of depending on workers to phone or bring them in.

They're also using the technique to give the yardmaster a view of activity and disposition of engines and cars in the yard.

To Come—There are about six firms now selling ITV to industry. Their success this year will be reflected in about $2 million of equipment sales. Their goal: $10 million by 1960.

When a company finds a method of producing powdered metal at a price competitive with ingot, a whole new technology beckons, the author told the Cleveland Chapter of ASM this Fall. That's what Whitaker Metals Corp., North Kansas City, Mo., has done with copper powder recovered from scrap and manufactured under license from Chemetals Corp., New York. The impact on powder metallurgy can be appreciated by a look at . . .

ROLL BONDING:



Copper Sidesteps the Crucible

WHEN METAL POWDER is cheaper than cast metal, new horizons open. It is easy to visualize the possibilities of forming many shapes without going through conventional operations.

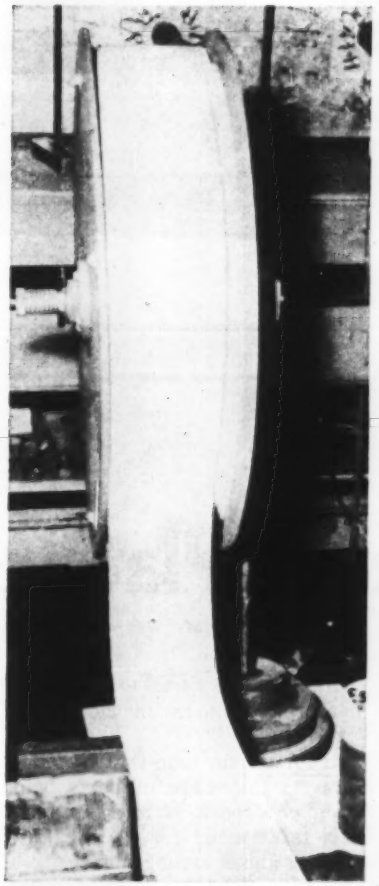
One method which portends a successful future is the roll bonding of metal powders into sheet, strip, rod and wire. The process was initiated on iron powder during the last war in Germany by the Mannesmann Co. It has been adapted to nonferrous metal powders in this country by Chemetals Corp., a research and development company which holds rights to license the process.

Easier Forming — Roll bonding offers a solution to shaping and forming metals and alloys that are difficult to produce by ordinary ingot rolling practice. Materials produced in sponge or powder form also may be used.

Materials are formed and shaped to specific sizes and thicknesses without preliminary working. The product has properties similar to those of normally rolled materials of the same chemical composition.

In roll bonding, powder of predetermined and selected properties is fed from a hopper to a set of horizontal rolls. The powder is compacted between the rolls and passes from them as a green, porous strip with sufficient strength to hold it together. The strip may be rolled on a reel or passed into an atmosphere furnace for sintering and consolidation. It is fragile but strong enough to run through the furnace on a belt or on rolls.

Sintering—When sintered for a brief period in the furnace at a temperature slightly below its melting point, the strip tends to shrink, densify, and consolidate. As it emerges from the furnace, it is not like normal dense strip made by conventional processes; rather it is a satiny, porous material. The strip must be further



Roll bonded and sintered copper

By JOHN D. SHAW
President
S-K-C Research Associates
Paterson, N. J.

consolidated by multiple rerolling and annealing until it attains full density and a structure comparable to strip made by other methods.

Wire rod is made in a similar manner. Sintered roll-bonded material is consolidated to over 90 per cent of the actual density, from which point it can be drawn through conventional dies into fine wire. In rod and bar made conventionally, particles of oxide on the surface tend to scale as the wire is drawn down to fine sizes. Powder rod does not possess this surface oxide. It is believed much finer wire sizes will be possible when powder is used as a starting material.

Determining Factors — Among major factors affecting rolling and properties of the strip are: 1. Particle shape and particle distribution of the powder. 2. Powder composition. 3. Roll clearance. 4. Roll diameter. 5. Surface condition of the rolls. 6. Speed of the rolls. 7. Power of the motor. 8. The extent of additional passes given the sintered strip.

Critical roll clearance is a factor of roll diameter. A ratio of 100 to 1 appears to be the conventional relationship between roll diameter and maximum strip thickness. This ratio is related to an angle of nip about 7 degrees and is dependent upon the coefficient of friction between powder and rolls. Basically, the thicker the strip, the larger the roll diameter must be.

Speedy Forming—As roll speed is increased, a critical point can be reached at which cohesive strip is no longer formed. However, with copper, for example, powder has been roll bonded at 30 rpm, and the limiting speed has not been approached.

Rolling of metal powder may be considered as a continuous molding process performed by narrow, linear segments along the rolls. Rolling takes much lower power than conventional powder molding processes.

Sintering temperatures are extremely important. Increase in strength and decrease in sintering time are dependent upon how close we can approach melting without appreciable distortion or softening of the strip with possible adhesion to the holding media. For example, copper is sintered at 1830° F, iron at 2190° to 2550° F, brass at 1560° F. Initial sintering times must be extremely brief (about two minutes on one experimental installation) to make possible reasonably short sintering furnaces for continuous operation.

Reduction—Degree of reduction should not exceed 10 to 20 per cent per pass, with an annealing step in between. Otherwise, transverse cracks will occur. After the fourth or fifth pass, the powder strip can be handled in the same manner as conventional strip. Good tensile strength is produced after 2 or 3 passes; several passes are required to achieve higher elongation values. Low annealing temperatures below the critical points are required or grain growth will be excessive.

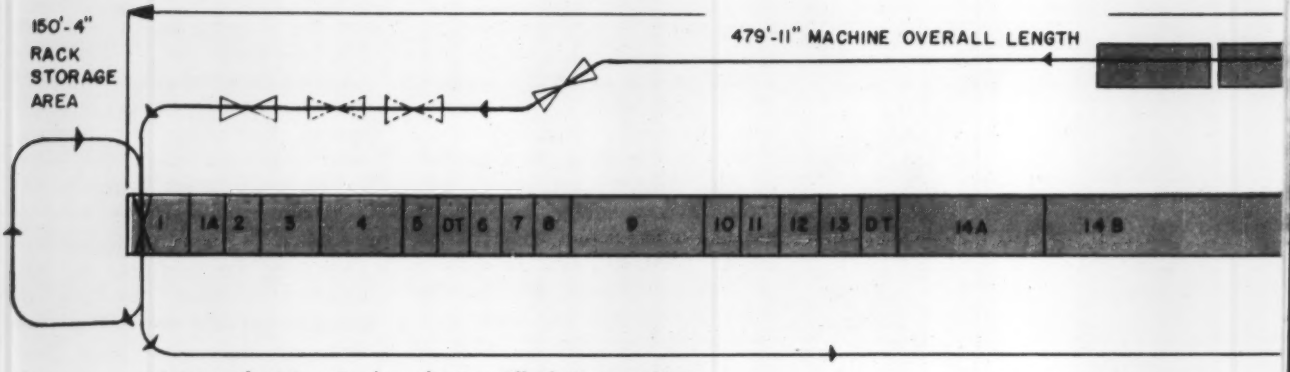
It is obvious that for the sake of economics, large scale production in powder production and roll bonding must be used. Both are definitely on the way. It is entirely conceivable that the magnitude of these operations can dwarf powder metallurgy as we know it.

TYPICAL PHYSICALS OF COPPER STRIP MADE BY ROLL BONDING

Annealed—100 per cent dense

Strip Thickness	Tensile Strength psi	Elongation in 2 in.
0.0106 in.	40,100	34.0 per cent
0.0061 in.	39,800	25.5 per cent

Electrical conductivity at 84° F—101 per cent



Layout of stations in the selective cell plating machine

By DR. ALLEN G. GRAY
Technical Editor

Automatic Plating

THAT'S THE story behind the new bumper plating machine at Pontiac.

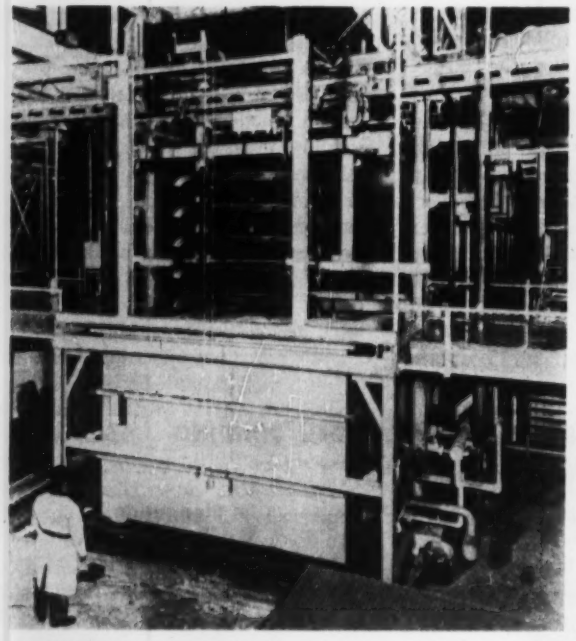
Curved areas on the bumpers dictated design. The conventional straight line machine does not allow placing of anodes to face the curved surfaces. That's because the work carrier enters one end of the plating tank and travels between rows of anodes to emerge from the plating bath at the opposite end.

New Principle—The Pontiac plating machine, designed and built by Udylite Corp., initiates a method of rack handling which allows parts to remain at rest in a nest of conforming anodes in the cells of the plating tank.

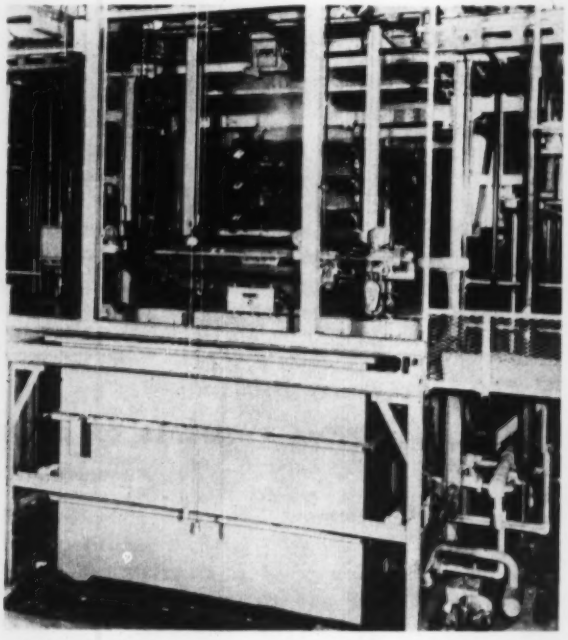
Platers have known for a long time that if anodes are placed to conform to the shape of parts being plated the distribution of deposit is more uniform.

The new method is tailor-made for plating large parts needing conforming anode arrangement.

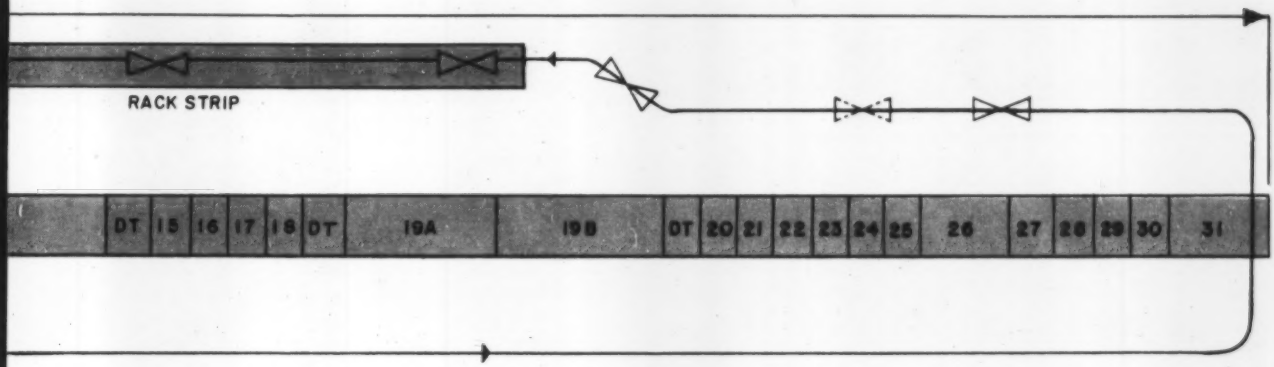
The Name—Udylite calls it their automatic selective cell machine. The mechanism selects in sequence



The Cleveland tramrail elevator is in the up position over the soak clean tank with a load of bumper bars



Tramrail has just put work carrier into cleaner. In background a rack of work is in the transfer position



Fits Design

empty cells in the plating section to accommodate racks as they emerge from preceding operations.

The Pontiac machine is the first one built. It is 460 ft long, 15 ft wide and 18 ft high. A 2 minute cycle plates 30 racks of bumpers per hour. It's set up to handle racks of 12 bumpers each; this gives an hourly production of 360 bumpers.

Granted, it's plating on a big scale but the same principle can be used on a smaller scale, say Udylite engineers.

Here's How—Work carriers are delivered to the machine by a Cleveland Tramrail. It crosses the first cell and at that point racks are transferred to the full automatic mechanism.

Racks of work pass from station to station through cleaning, pickling, copper, nickel and chromium plating (see chart). Eventually, Pontiac expects to run the machine with two operators—one at entry, one at exit.

Plating Cycle—For the '55 Pontiac bumpers it's a copper strike, followed by 0.0007 in. of copper plate from the Daybrite acid copper solution.

Copper plated bumpers after rinsing go directly into the nickel strike, followed by 0.0008 in. nickel plate from a Udylite bright nickel bath.

After nickel comes chromium plating; thickness of 0.00001 to 0.00002 in. goes over the nickel to give it added gleam and to preserve tarnish resistance.

Dry Off—After going through rinses, racks are picked up at the hot air blow-off station and transferred to the tramrail system. The bumpers go to the assembly line; the racks go through the rack strip (see diagram) back to the storage area.

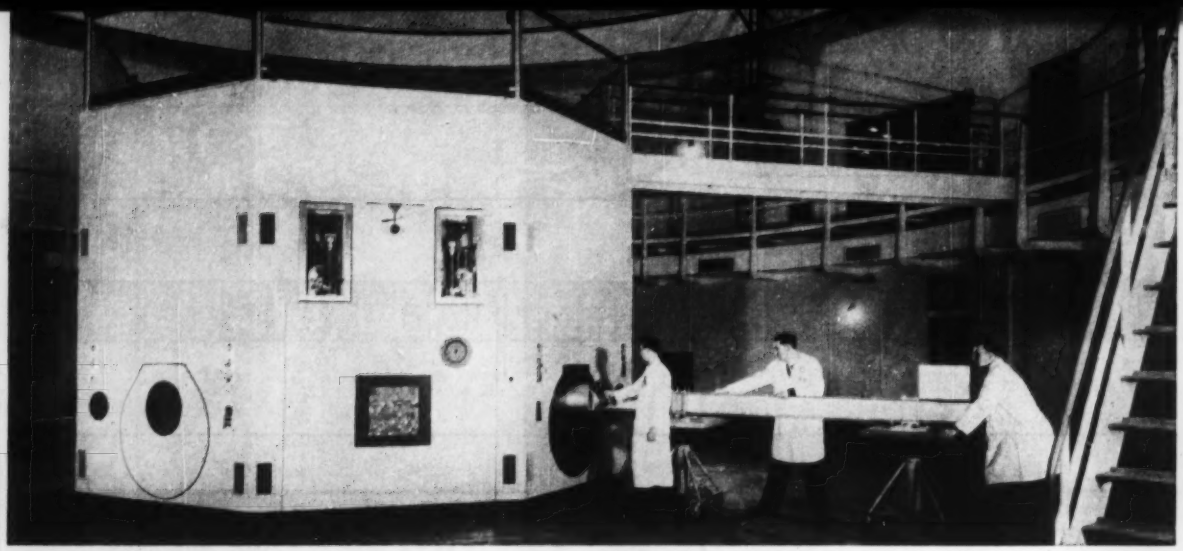
Racks go through the built-in rack strip station on the tramrail. The carrier lowers into the rack strip tank and is carried through the 8 stations by the tramrail carrier motor.

Save Here—Racks are a high investment for the plating department (ones at Pontiac weigh 1500 lbs, loaded). They must be changed frequently to accommodate new designs.

This point was kept in mind in planning the Pontiac line, says John V. Davis, Udylite's chief engineer. Less than 5 per cent of the racks are out of the plating cycle at any time. They are only used when needed for plating and are not tied up in auxiliary handling operations.

CYCLE FOR PLATING BUMPERS

STATION	PROCESS	TIME (seconds)
1	Load and soak clean	150
1A	Soak clean	150
2	Warm water power spray	75
3	Power wash	225
4	Cathodic clean 10,000 amp; 9 volts	225
5	Cold water rinse	75
D.T.	Drain and transfer	45
6	Acid dip	75
7	Cold water rinse	75
8	Cyanide dip	75
9	Cyanide copper strike	5 minutes
10	Recovery rinse	75
11	Cold water rinse	75
12	Cold water rinse	75
13	Acid dip	75
D.T.	Drain and transfer	30
14	Copper plate—0.0007 in. Two tanks, 24,000 gal each 60,000 amp at 6 volts Daybrite acid copper	30 minutes
D.T.	Drain and transfer	30
15	Recovery rinse	75
16	Cold water rinse	75
17	Cold water rinse	75
18	Nickel strike	75
D.T.	Drain and transfer	30
19	Nickel plate—0.0008 in. Two tanks, 24,000 gal each 40,000 amp at 9 volts Udylite bright nickel	30 minutes
D.T.	Drain and transfer	30
20	Recovery rinse	75
21	Cold water rinse	75
22	Cold water rinse	75
23	Acid dip	75
24	Cold water rinse	75
25	Warm water rinse	75
26	Chromium plate—0.00001 in. 20,000 amp at 12 volts	75
27	Recovery rinse	75
28	Cold water rinse	75
29	Cold water rinse	75
30	Hot water rinse	75
31	Hot air blow off	75



New Research Reactor. It shows . . .

What You Can Do with a Few Kilograms of Uranium 235

THE WRAPS have just been taken off CP-5. It's the AEC's newest research reactor (Chicago pile No. 5) at Argonne National Laboratory.

This modern research instrument is ideally suited to many industry irradiation services, AEC says. Fueled with aluminum clad uranium enriched in the isotope 235, it's cooled and moderated with heavy water.

Atom experts estimate that 100 kilograms of uranium 235 will keep 15 such reactors in operation for five years and still have almost two thirds of the fuel unconsumed.

Many Jobs—One of the most important assets of CP-5 is its versatility. The high neutron flux created inside the octagon-shaped reactor is used by placing objects to be irradiated into one of the more than fifty apertures which penetrate its eight sides and top.

By using just one of these access holes, a radioactive cobalt source of a thousand curies could be made each year. This is equivalent to 1000 grams of radium that used to sell for $30,000 a gram.

Pay-off—AEC says that industrial uses of atomic energy is already saving industry a hundred million dollars annually in this country. This results from applications in thickness, quality, wear gaging and control devices. Gamma ray radiography locates flaws in castings.

Applications are growing daily as new uses are found. Under the new Cole-Hickenlooper act in five years American inventiveness will be almost as free in the atomic energy field as in any other, says Lewis L. Strauss, AEC's Chairman.

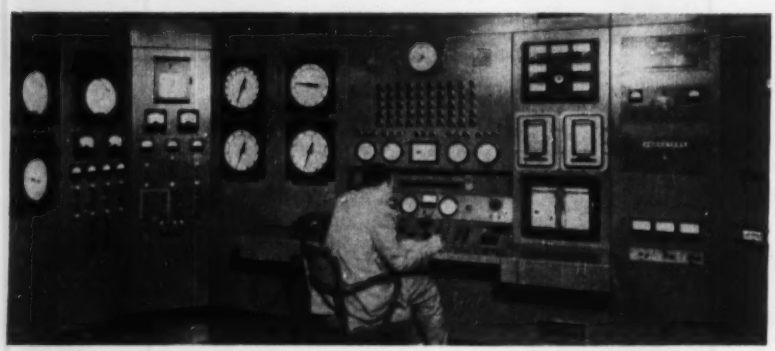
Cost — CP-5 is not fabulously expensive. Its cost (exclusive of fuel and moderateor) for the reactor, reactor building and associated laboratories is about 2¼ million dollars.

The concrete reactor is 20 ft wide and 13½ ft high. Operation is controlled by technicians in an overlooking control room (lower photo).

Control Panel—Two elongated scales at the operator's eye level are light beam galvanometers. They indicate the nuclear power of the reactor. The position of the four safety rods which control the operation of the reactor are indicated by four circular dials directly above the galvanometer's scales.

The position of the regulating rod used for fine control is shown by the square dial. A group of fifty annunciator lights indicate conditions of flow, temperature and pressure of the heavy water, helium and air associated with the operation. An electronic circuit computes its thermal power.

In addition to producing radioisotopes, CP-5 can be used for radiation physics measurements, studies of the nuclear properties of matter and for experiments to develop better instruments for future reactors.



a CMP cost cutting report

ON INTRICATE PARTS

BEFORE

This manufacturer of intricate machine parts had numerous fabrication problems with standard specification cold rolled strip steel. First, the gauge tolerance variance presented difficulty when finished parts went to assembly where a close fit was required, causing many rejects. Production slow-downs were frequent and costly. Die life was shortened, too. Even though the parts are small and produced in great quantities where cost of steel per piece is insignificant, the resulting finished product cost was mounting because of the difficulties and added manual work.

AFTER

Presenting the CMP story of "specific specs" to the purchasing department of this manufacturer, a CMP representative was invited to meet with their production management. He suggested several different specifications for the various items they were producing and arrangements were made to test run the "specific spec" steel for their own check.

Improved results were immediate and final specifications for all items were established as best for each job. As was later related, the production chief said, "While our steel cost went up, we so completely beat our production and assembly problems that those savings dwarfed the steel cost." Perhaps there is an answer for your requirements, too, in CMP "specific specs" cold rolled strip steel -- we'll be glad to explore it with you.

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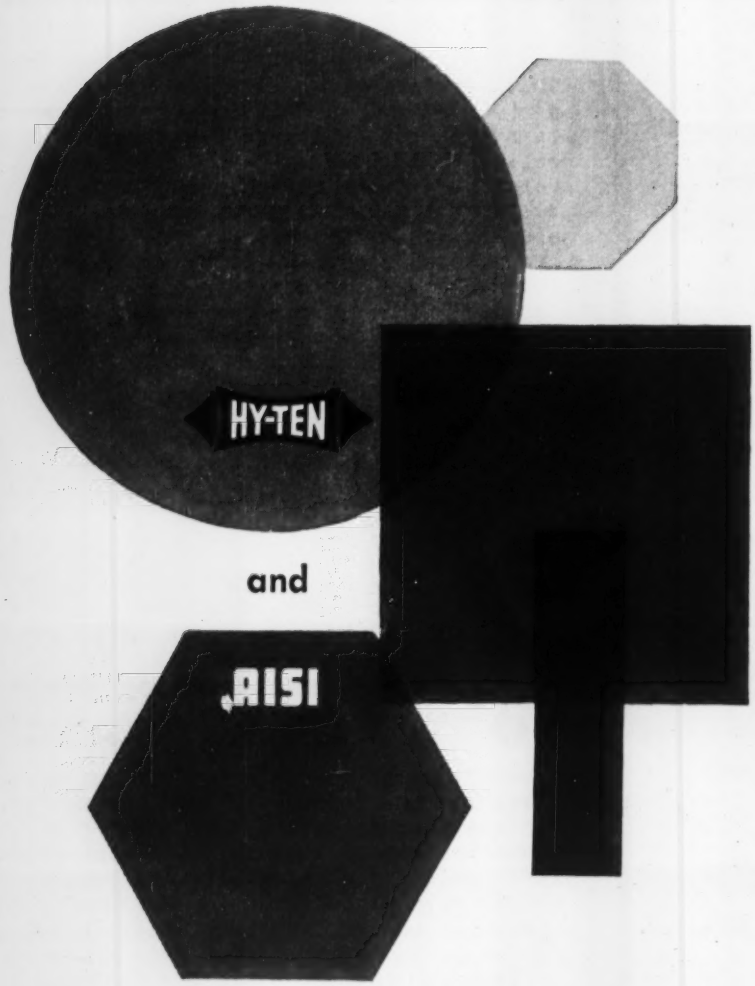

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Impregnating Castings

In instrument components, porosity must go. Impregnation does the job

MICROSCOPIC pores in cast instrument components, a vexing problem in airborne fire control systems, has been solved by Farrand Optical Co. Inc., Bronx, N. Y., with an impregnation process, developed by American Metaseal Mfg. Corp., West New York, N. J.

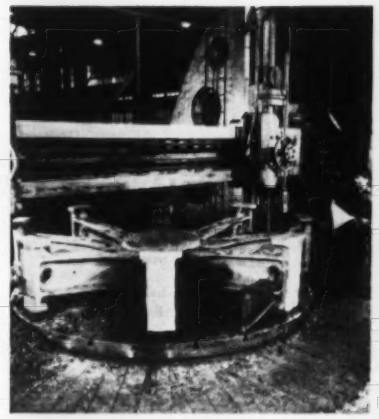
Because efficiency and accuracy of the system depends on complete pressure-tightness, Farrand engineers realized that leakage due to microporosity in the system's cast aluminum components must be completely and permanently eliminated.

IMPREGNATING THE PORES
. . . resin does the trick

Severe Test — Airborne instruments are sensitive to pressure and temperature variations in the atmosphere. Those produced by Farrand are subject to temperature fluctuations ranging over 100 F and pressure variations of several inches of mercury depending on altitude of flight.

In the airborne fire control system, the housing, azimuth plate, mirror bracket, control drive, eye piece plate, and other parts are cast of lightweight aluminum (Type 356T6). Castings are machined and anodized, then impregnated, to prevent air leakage throughout the aluminum parts of the system.

After impregnation, the parts are cleaned, checked and assem-



Eight-Ton Spider

A 16,000-lb, 170-in. diameter spider for a turbogenerator is being rough-milled on a vertical boring mill at Union Steel Castings Division, Blaw-Knox Co., Pittsburgh. The 14-ft table turns the spider 150 fpm, mills castings up to 304 in. in diameter. Maximum operating height is 127 inches

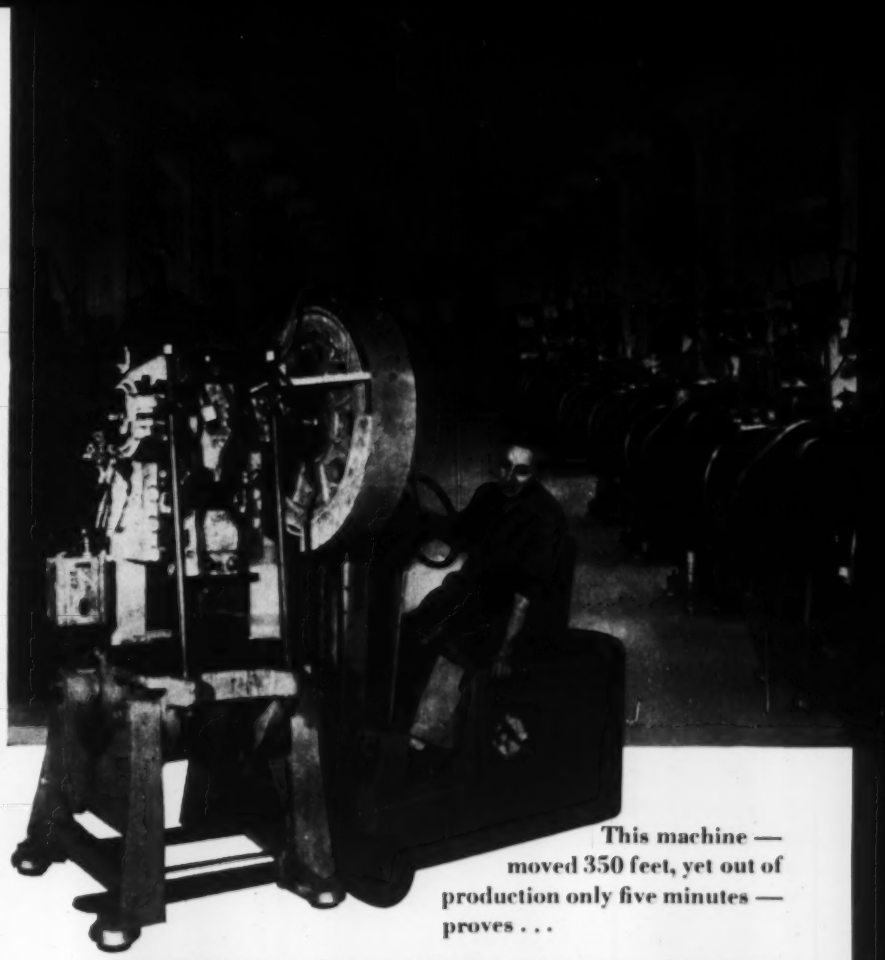
bled; then the system must withstand pressures up to 20 psi.

How It's Done—Farrand chose Metaseal's Model 1-36-L impregnating unit and their 19V5 polyester impregnating resin. Covering an area of less than 70 sq ft (4 x 16 ft), the installation consists of the autoclave, cleaning and rinse tanks, reservoir, vacuum pump and auxiliary equipment such as a vapor trap, valves and gages.

Presently, Farrand's installation is not operating at capacity, but it is capable of processing 100,000 lb of castings per month. Ability to meet and control schedule commitments and handle emergency impregnating work are coupled with the convenience of doing the work on the premises.

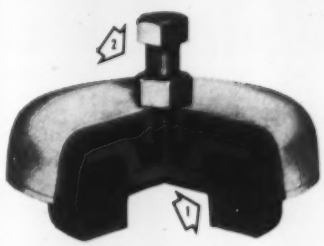
The Process — The Metaseal process uses a batch-type vacuum-pressure method designed for simple one-man operation. Castings are placed in an autoclave; this evacuates any pore connected to the surface of the casting. Impregnant is introduced to the autoclave and compressed air is applied to force it into the evacuated pores.

Pressure is released, the castings are removed from the autoclave and cleaned. A curing operation solidifies the liquid impregnant which has been absorbed into the metal structure.



This machine — moved 350 feet, yet out of production only five minutes — proves . . .

MOBILE MACHINERY CUTS COSTS



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Part 5

Correlating Blast Furnace Operating Concepts

Substitution of volatile-free magnetite ore for volatile-bearing reduces heat requirements for preparing ore for smelting. Author discusses thermal effects in detail

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operations
Cleveland

PILLING's paper contains a lesson for all furnace operators. It illustrates the change in thermal effects which accompany change in burden material properties. A few extracts follow:

1. "The successful use of magnetite ore in the blast furnace was found to depend on a number of factors, all of which must be carefully determined for each case. The primary consideration is that of working volume of the furnace above the tuyeres, because the time required for the reduction of magnetites is from 3 to 4 hours longer than for an equal amount of hematite. The design of the bosh is important. Unless every precaution is taken, the fine magnetite ores tend to work in a high zone of fusion in the furnace, raising the ratio of direct to indirect reduction. This tends to increase fuel consumption in probably all commercial cases. It has been found that the bosh should be kept as low as possible with a steep bosh angle."

Reference to the working volume of the furnace above the tuyeres as a primary consideration, and the need for a low bosh, is recognition of the 2-stage principle of furnace operation—but apparently without clear understanding of the need for adjustment in heat distribution caused by the change in burden material requirements. In the light of later development in the use of magnetite ore (example—East) and the teachings of technical science regarding thermal requirements, it is not correct to believe that a change in furnace lines from those which are adequate for other materials is a requisite for successful smelting of magnetite ore.

Reduction Rate Differs — Any lump material will reduce slowly and any fine material will reduce rapidly because of: 1. The difference in ratio of surface to mass which determines the rate of heat absorption. 2. The conditions which make reduction possible.

Obviously, the tendency of the magnetite fines to "work in a high zone of fusion" is caused by the reduction in heat consumption for preparation by the volatile free magnetite fines (compared to volatile bearing hematite fines) without any compensating reduction in the amount of heat delivered to the high zone.

Reference to the affect upon the fuel rate from an increase in direct reduction of Fe is open to

BEST ORE MIXES—DESCRIBED BY PILLING

Magnetite lump, %	20.00
Magnetite concentrates, %	20.00
Lake hematite ore, %	60.00
	100.00
Blast temperature, °F	1100
Top gas temperature, °F	450
Composition magnetite ores, %:	
Fe	58.00 to 63.80
P	0.021 to 1.00
Mn	0.03 to 0.13
SiO_2	6.00 to 8.20
Al_2O_3	1.33 to 1.63
Bases	0.70 to 3.50
S	trace
TiO_2	0.00 to 1.15

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Silicon, %	-1.00	
Coke consumption, lb/ton	2000 to 2100	

*Probably gross tons

question because of later findings. In 1923, the belief was probably widely held that reduction of Fe in a blast furnace was an endothermic reaction the same as it is in a laboratory test. When considered as an exothermic reaction, in its complete cycle, the zone in the furnace where Fe reduction occurs is of little, if any, practical importance to furnace operation or to conversion economy. Quoting Pilling again:

2. "It is important, when working magnetic ores, as well as all other ores, that the coke used will burn freely and quickly at the tuyeres, thereby keeping the zone of fusion as low as possible; at the same time it should be dense enough so that there will not be any excess of loss by solution and direct reduction by carbon.

"It is not practical to blow as much air when smelting fine magnetic ore as when smelting an equivalent hematite ore. If the furnace is overblown, the zone of fusion tends to rise, thereby increasing the percentage of direct reduction, the ore comes through in an unreduced state, and top heats immediately rise above the level for most economical operation."

How Principle Works—Substitution of volatile-free magnetite ore for volatile-bearing hematite ore reduces heat volume (Btu) requirements for preparing ore for smelting. Delivery of a greater percentage of the magnetite ore burden weight to the smelting operation than could be delivered from an equal weight of hematite ore increases the need for heat volume in the smelting operation.

Any blowing rate in excess of the amount required for maintaining equilibrium in heat distribution between the two divisions of work drains heat from the division where need for it had been increased and would deliver it to the division where need for it had been reduced. Application of the principle, as determined by the thermal requirements of burden materials used, will apply with equal force at any blast furnace operation, anywhere.

3. "The furnace operation is exceedingly smooth and regular; the blast pressure uniformly low and even; and the furnace settles with practically no trouble from hanging and sticking. A high blast temperature can be carried without difficulty, thereby effecting further savings in fuel."

Pilling used burden mixtures of magnetite and hematite ores, both sintered and unsintered, in various percentages from 40 to 60 per cent magnetite. At a time when only 1000 to 1100° F blast temperature was available, a total burden (ore, stone, scrap) of about 2.40/1.00 was the maximum which could be carried. With such conditions, blast pressure was consistently about 15 per cent below the normal pressure for a Lake ore burden of similar size. At a later time, when blast temperature of 1500 to 1600° F was made available, and 100 per cent iron rich volatile-free iron-bearing materials were substituted for all volatile-bearing material, burden ratios were substantially increased (see East—3.00/1.00). Blast pressure was consistently about 20 per cent above the normal pressure for a similar sized Lake ore operation. With either condition of pressure and blast temperature, the furnace never hung or slipped.

When this fact is studied, the basic accuracy of the 2-stage principle of furnace operation is again brought to light.

Identified with Burden Materials—A principle: At any blast furnace operation the ratio of capacities between the two divisions of work will be determined by thermal requirements of the burden materials. Requirements will be determined by the properties of the burden materials; the division having the lesser capacity will determine the productive capacity of the combined divisions.

It also may be stated as a principle that heat volume (Btu) delivered to the furnace with the blast must be consumed in the hearth: Heat volume in excess of hearth consumption increases the temperature (Btu concentration) in the bosh. When bosh temperature exceeds smelting division requirements, the ill-effect is reflected in increased gas velocity leaving the upper bosh and entering the shaft. This disturbance to equilibrium between the divisions of ore preparation for smelting and smelting causes the stock column to hang or slip.

All Lake ore furnace operations are deficient in burden preparation capacity in relation to smelting capacity. In support of the above principles: 1. The well-known facts of Lake ore furnace practice that any furnace can be made to "stick" by using high blast temperature because the furnace will not take heat. 2. Virtually all furnaces using Lake ores have a surplus of blast heating capacity which they are unable to use.

Changeover Affects Smelting—Substitution of volatile-free magnetite ore, sintered or unsintered, for volatile-bearing ore in the Eastern district furnace operations being described reduced the amount of burden preparation work and increased the amount of smelting work which had to be performed. Consequently, the smelting capacity became deficient in relation to preparation capacity, and all available blast heat could be used without disturbance of the equilibrium between the two divisions of work.

4. "The fuel consumption when using 100 per cent magnetic ore was uniformly higher than for hematite or sintered magnetite ore.

"Further experience showed that best results were obtained by the use of sintered fine magentic ores, while fine magnetic ores gave bet-

(*Continued on p. 88*)

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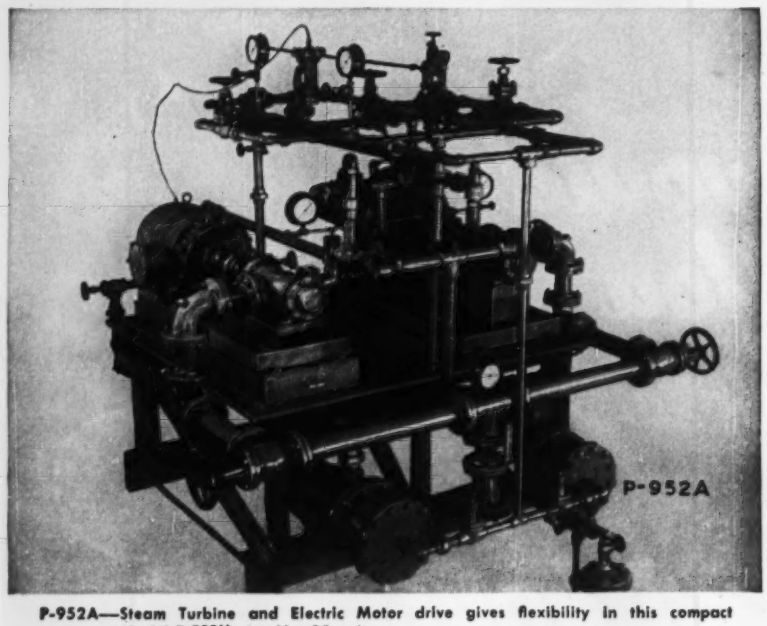

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NATIONAL AIROIL Fuel Oil Pumping and Heating Units are specially designed to prepare, for combustion, all grades of fuel oil including No. 6 or Bunker "C" Oil and residuums. They will draw fuel oil from above ground or underground tanks, preheat it to proper constant temperature and deliver it to Oil Burners at an even pressure, best suited for the burners. Our Fuel Oil Pumping and Heating Units are the result of years of experience. They come completely equipped ready for steam, exhaust, condensate, oil suction, oil return, and electrical connections. All valves, regulators, etc., are readily accessible. The piping arrangement is easily understood. These compact, space-saving units are available in a range of sizes and models in both Medium and High Pressure types. For complete details, write for our Bulletin 40 — very interesting and informative.

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes
STEAM ATOMIZING OIL BURNERS
SLUDGE BURNERS, Steam Atomizing
MOTOR-DRIVEN ROTARY OIL BURNERS
MECHANICAL PRESSURE ATOMIZING OIL BURNERS
DUAL STAGE, Combining Steam and Mechanical Atomization
LOW AIR PRESSURE OIL BURNERS
AUTOMATIC OIL BURNERS, for small process furnaces and heating plants
GAS BURNERS
COMBINATION GAS & OIL BURNERS
FUEL OIL PUMPING and HEATING UNITS
FURNACE RELIEF DOORS
AIR INTAKE DOORS
OBSERVATION PORTS
SPECIAL REFRACTORY SHAPES

NATIONAL AIROIL BURNER CO., INC.

1392 EAST SEDGLEY AVE., PHILADELPHIA 34, PA.
Southwestern Division: 2512 South Boulevard, Houston 6, Texas

PROGRESS . . .

(*Continued from p. 86*)

ter results than the use of lumpy magnetites. Trials in which magnetites and hematites were mixed in the furnace were satisfactory. This was probably due to the furnace being operated on similar lines to those followed when the ore used was all hematite, while the circumstances demanded that the furnace should be driven at a rate to suit the material which is slowest in reduction. The whole problem of working magnetic ore in the blast furnace, therefore, is one which requires a considerable amount of study and care to bring all of the factors into thorough accord."

The fuel rates recorded, when compared to fuel rates subsequently obtained at several Eastern district furnace operations using magnetic ore (example—East) are indicative of the importance of the effective recovery and use of heat rather than the amount of heat which can be generated.

Concurs on Ideal Burden—Pilling's comment that best results were obtained with use of 40 per cent magnetite and 60 per cent Lake ore (see tabular matter appearing on p. 86) is an item of particular interest because a like belief is held by middle West furnace operators regarding the amount of sinter (40 to 50 per cent) which may be used most successfully in a furnace burden. In the light of furnace operating principles involved in both cases cited the change effected in relationship of thermal work required in the divisions of preparation for smelting and for smelting is the basis of the belief.

Substitution beyond 40 to 50 per cent volatile-free material for volatile-bearing material, will create a critical stage of equilibrium between the divisions of work beyond which further substitution is impractical unless a compensating adjustment is made in the heat distribution. Since the blowing rate is the agent for heat distribution, to say 40 to 50 per cent volatile free-material is all that can be used successfully is a half-truth, unless accompanied with the qualifying statement: That it is all that can be used successfully with a blowing rate which is preferable when 100 per cent volatile-bearing material is used.

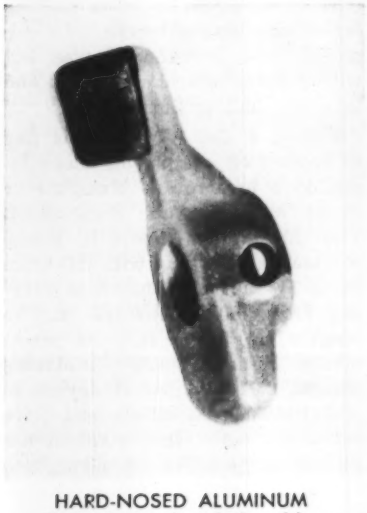
(*To be continued*)

Flame Plating Aluminum

Tungsten carbide on the wearing surface of heater parts more than treble life

HOW TO MAKE a lightweight drive arm with high wear-resistance posed a difficult design problem to the Herman Nelson Division, American Filter Co., Moline, Ill., manufacturers of aircraft heater mechanisms. Plastic inserts, high alloy precision castings and machined high alloy forgings were considered, but high cost or weight made them impractical.

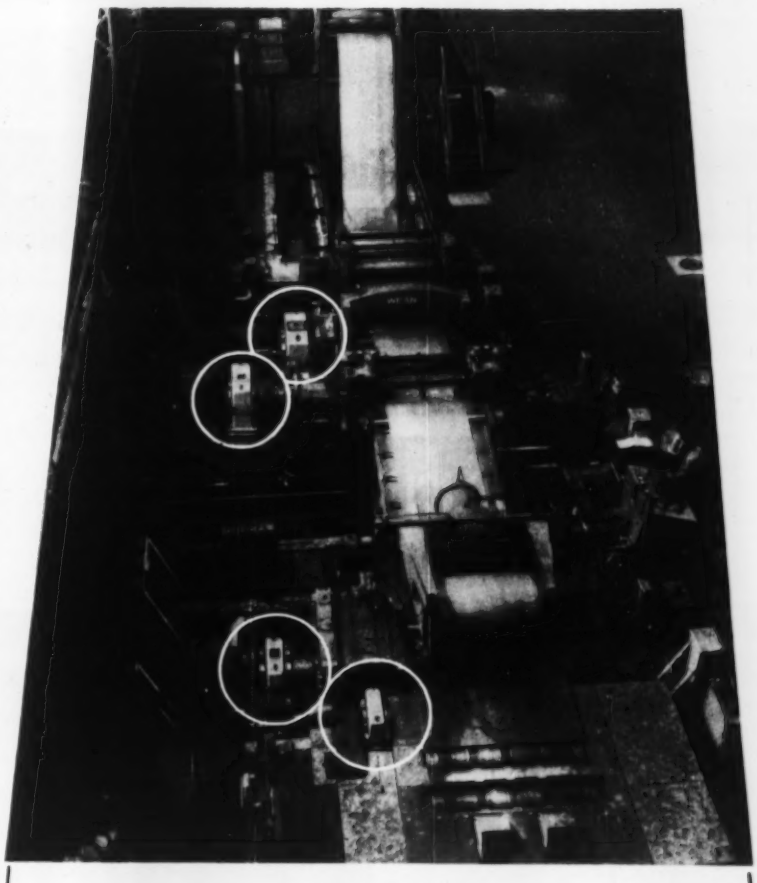
The problem was solved by using a forged aluminum part which had been plated with tungsten carbide by Linde's flame-plating process. An unusual combination of lightweight, low inertia and high resistance to wear was developed. An unplated forged aluminum drive arm had an expected service life of 100to 300 hours. After flame-flame-plating this part easily exceeded required 1000-hour mark.



HARD-NOSED ALUMINUM
. . . flame-sprayed carbide adds wear

The tungsten carbide coating may be left in as coated condition (125 microinches rms) as in the case of the forged aluminum drive arms or ground and lapped to a mirror-like smoothness (1 to 5 micro-inches rms) for such applications as plug gages.

Plug and ring gages, gripping dogs, turbine shaft seals and core rods are a few of the current flame-plating applications where success has been recorded.



Proven Trouble Free Service and Economy of Operation

The Wean Engineering Company have built and installed continuous pickle lines (similar to the one illustrated above) in most of the leading steel companies . . . and for many years have *specified* H & S Reducers and Pinch Roll Drives. By experience Wean has proved that H & S products give trouble free service and economy of operation due to their exceptionally Rugged Construction and Ample Overload Capacity.

It will pay you to learn more about the high quality and superb construction of H & S products.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 Hamilton Avenue
Cleveland 14, Ohio

Send note on Company Letterhead for 488-Page Catalog 49

Accuracy Highlights Tube Work

Works steel tubing with OD from ¼ to 1¼ in; wall from 0.035 to 0.125 in.

MACHINES too big or too small for straightening carbon, alloy and stainless tubing in diameters between ¼ and 1¼ in. caused a re-examination of its straightening equipment by Globe Steel Tubes Co., Milwaukee.

Globe is basically a seamless tube mill, but has some welded tube production. Its product range is from ¼ to 8 in. OD. When the smaller tube sizes were straightened, conventional difficulties were experienced due to out-of-size straighteners. In addition, tube occasionally was left with exterior spiral markings and interior shadow lines.

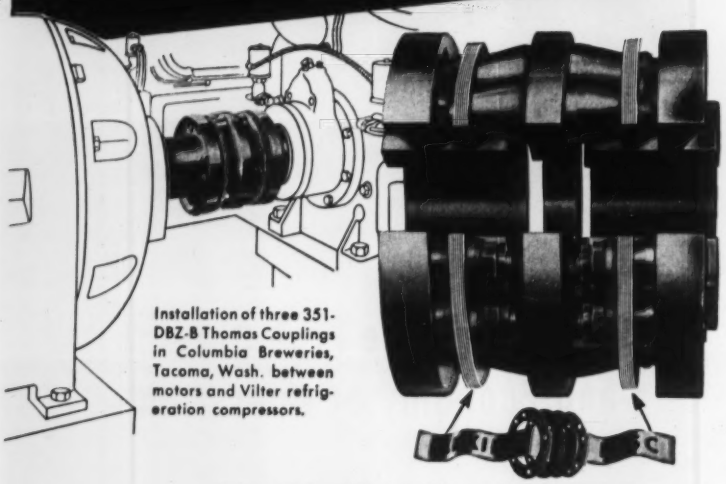
Filling a Gap—To fill this gap in production equipment, Globe installed a new rotary straightener in its stainless tube department. The Mackintosh-Hemphill model AX works on tubing with OD from ¼ to 1½ in.; wall thickness varying from 0.035 to 0.125 in.; in lengths up to 45 ft. It meets straightening specs centering around 0.010 in. per ft deviation.

A Reliance variable speed drive installed with the straightener makes it possible to straighten tubing accurately at optimum production speeds for the various stainless grades, at faster speeds for carbon and alloy.

The six power-driven rolls are set to secure a slight burnishing effect on the tubing. When annealed, it's transformed into a bright appearance. Tube generally meets specs after one pass, despite high hardness.

Straightened tube is used in the oil industry, for atomic industry purposes, in aircraft parts and for heat exchanger and furniture manufacture.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

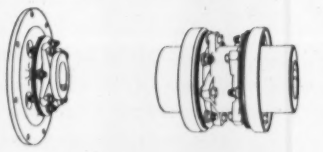


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

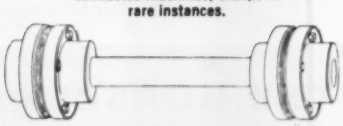
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



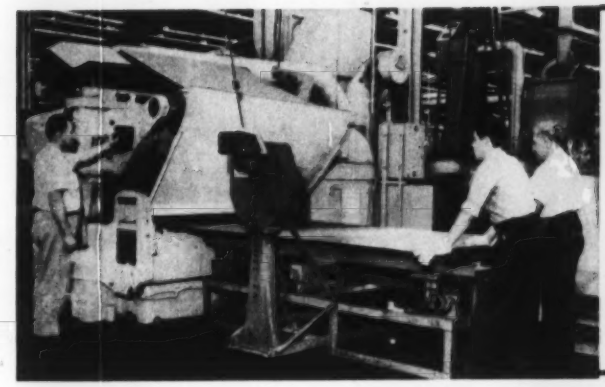
Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



THOMAS

Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



Stock Removal Is Automatic

Cost is down, production up 50 per cent in the sheet grinding operation

AUTOMATIC reciprocating pinch roll equipment used in grinding sheets for hollow steel propeller blades reduced costs and upped production 50 per cent in the grinding operation. The work is done at Hamilton Standard, division of United Aircraft Corp., Windsor Locks, Conn.

The sheet is made from a flat, cold-rolled alloy steel sheet about 110 in. long and 54 in. wide. They use a wide belt grinder to remove excess stock, since sheets received from the mill vary as much as 0.006-in. in thickness. Importance of balance in blades makes specified sheet thickness vital.

Average Job — The average sheet weighs about 65½ lb and requires removal of 0.002-in. of stock. About 20 passes with a 60-grit belt coated with aluminum oxide abrasive roughs off the stock. With the pinch roll or through feed method, a sheet was fed in one end, taken out the other and moved around the machine to its starting point. Repeated 20 times, the procedure meant each sheet was handled 40 times.

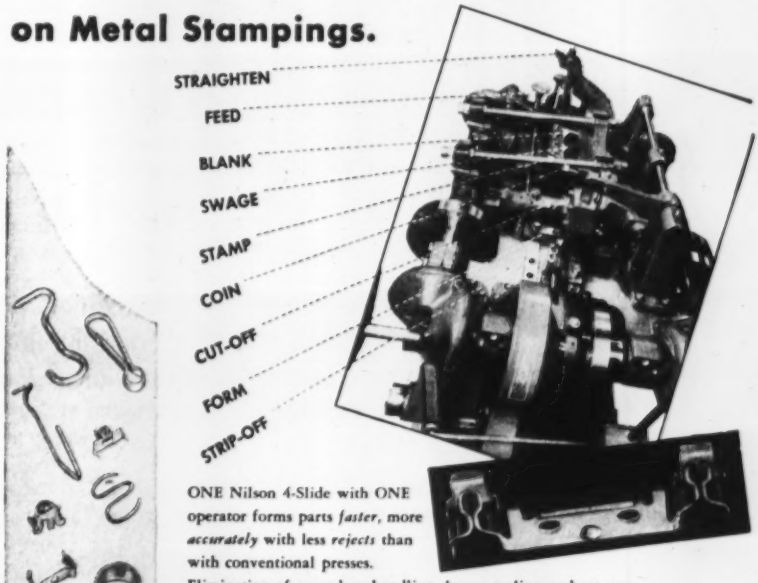
To combat a slow and expensive setup, they installed a photo cell over the machine's weight-checking table and a microflex counter on the machine. The counter set for the required number of passes, the photo cell reverses the pinch roll after each pass. When the counter completes its preset cycle, the sheet is rejected onto the checking table.

Sheet is ground with and against direction of abrasive belt travel. Amount of stock removed per pass is almost 50 per cent greater than with through-feed method.

FORMED COMPLETE-*AUTOMATICALLY!*

NILSON FOUR-SLIDES

Combine Operations to Lower Costs on Metal Stampings.



ONE Nilson 4-Slide with ONE operator forms parts *faster*, more *accurately* with less *rejects* than with conventional presses.
Elimination of secondary handling, lower tooling and set up costs *means added profits.* Wide range of models for wire and ribbon metals. Feed lengths to 32", stock widths to 3½" Press capacity to 75 tons.

For specific recommendations — send details of your operation.

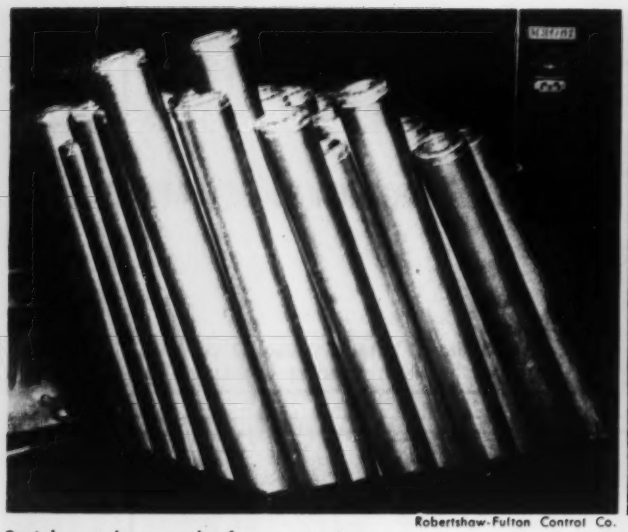
THERE'S NILSON *NOTHING LIKE A*

Write, Wire, Phone for full particulars.

THE A. H. NILSON MACHINE COMPANY

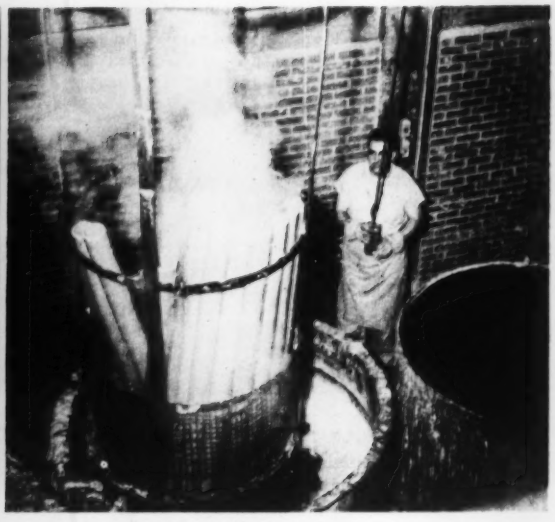
1512 Railroad Avenue • Bridgeport 5, Connecticut

Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Strip Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses



Robertshaw-Fulton Control Co.

Stainless tubes ready for processing



Heat treatment is an important step

The Story of the Metal Bellows

Invented 50 years ago by a Knoxville, Tenn., weatherman, this workhorse in industry and the home is basically formed in one automatic operation. Materials range from brass to monel

WHEN Weston Fulton was a $60-a-month employee of the U. S. Weather Bureau in 1889, he made the first metal bellows in his backyard woodshed. A soldered brass affair, it measured the effects of lightning on the atmosphere.

Soon, Mr. Fulton found that bellows could be drawn from flat stock, as the silversmith builds a cup or bowl from a sheet of sterling. Today, his method (several refinements later) is still employed at the company he founded in a rented room in Knoxville, Tenn.

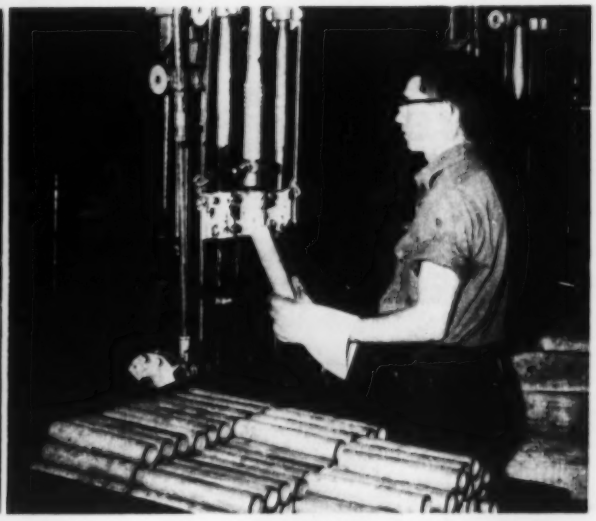
The Fulton Sylphon division of the Robertshaw-Fulton Controls Co. is now one of the largest manufacturers of temperature and pressure control devices in the country.

All-Arounder — Used in more than 19 basic industries, bellows are made from a variety of materials, including stainless, phosphor bronze, beryllium copper, monel and other metals. Applications run into four figures.

Filled with gas or a volatile liquid and sealed at each end, bellows react to pressure and temperature changes. As thermostatic devices, the accordion-fold tubes form the nerve center of the autostat, a device that speeds engine warm-up time on the family auto. Opening and closing valves and electric circuits with variations in temperature, bellows have changed many manually-operated devices into modern effort-saving automatic machines.

In jet aircraft, bellows insure correct fuel and air mixtures by counteracting varying air pres-

Cutting to size, before corrugation



Folds are next stamped into the metal

sure, and down at Oak Ridge they are used as regulators in atom plants.

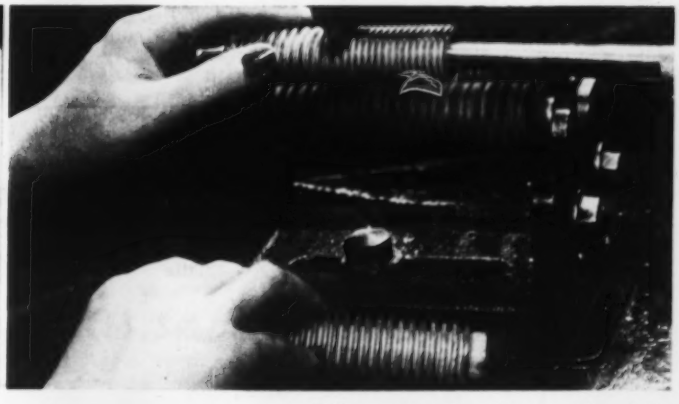
Two Ways—Stock is received in strips or coils at the Knoxville plant. In one automatic operation, round blanks are punched and formed into deep cups, go through a series of draws and anneals (to establish diameter and wall thickness), then trimmed to the required size.

Most bellows under a 4⅜ in. OD are formed hydraulically; larger units are formed mechanically with roll dies. To produce the former, the tube is placed in a hydraulic machine and pressure is applied inside the tube, forcing it to take the shape of the corrugated die. Cold work is imparted chiefly to outer bends.

The other process includes the forming of a number of broad corrugations in the tube wall and successively deepening and narrowing them with rolls. The diameter of the tube is less than the outside and greater than the inside diameter of the finished bellows. Cold work is imparted to inner and outer bends.

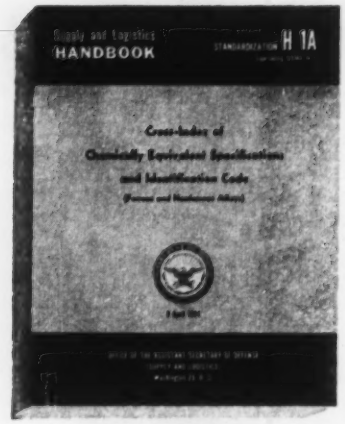
An expanding mandrel does the work

End products look like this



Rolling operation deepens the folds

More Help With Metal Specs



YOU NEED all the help you can get these days to untangle metal specifications.

You can get it from the new revised cross-index of chemically equivalent specifications for steel and nonferrous alloys, just published by Department of Defense.

It's a 345-page reference book that defines and compares the compositions of all metal specifications. It will save you valuable production and engineering time by curbing confusion about the various specification systems.

Scope—Listed and cross-indexed are specifications of Army, Air Force, Navy, AISI, Dept. of Defense (MIL and JAN), ASTM, SAE, Aeronautical Standard Group, General Services Administration (Federal), Aeronautical Material (SAE) and Aluminum producers.

Metals included are iron and steel, copper, nickel, cobalt, titanium, lead, tin, silver, aluminum, magnesium, zinc, bismuth, cadmium, antimony, gold, platinum and their alloys.

Up-To-Date—The handbook is a revision of a previous cross-index completed late in 1952. A realization of the need of the metalworking industry for a complete rundown on metal specifications led STEEL to undertake publication of its Specifications Handbook based on the government's 1952 edition. Over 20,000 copies of STEEL's handbook were distributed, but the supply is exhausted; and because of revisions included in the new edition, it will not be republished.

How—To keep posted on the latest information on specifications, you can obtain copies of the new government handbook through STEEL's Readers' Service department, or from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Cost is $1.75 per copy, postpaid, payment with order.

When ordering from the Government Printing Office, ask for Supply and Logistics Handbook H 1A, "Cross-Index of Chemically Equivalent Specifications and Identification Code." When ordering through STEEL, use coupon below.

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Send me_____copies of the government's Cross-Index on metals specification at $1.75 per copy, postpaid. **Enclosed is my check for**_____.

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(Please print or type)

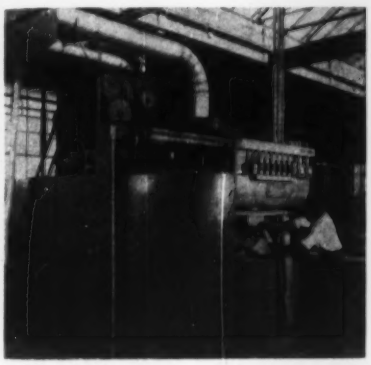
Bond Preparation

FIELD TESTS prove that you can shot blast in preparation for bonding various phenolic coatings used on containers for edible products.

Previously, scouring or cutting action of grit was believed necessary to get a surface clean or rough enough to hold any of the bonded materials.

New Method—American Wheelabrator & Equipment Corp. reports that with application of steel shot abrasive to the blast cleaning operation, less resin is required to cover a shot blasted finish. High peaks and deep cuts of a grit finish are eliminated, resulting in a uniform coating at a lower cost.

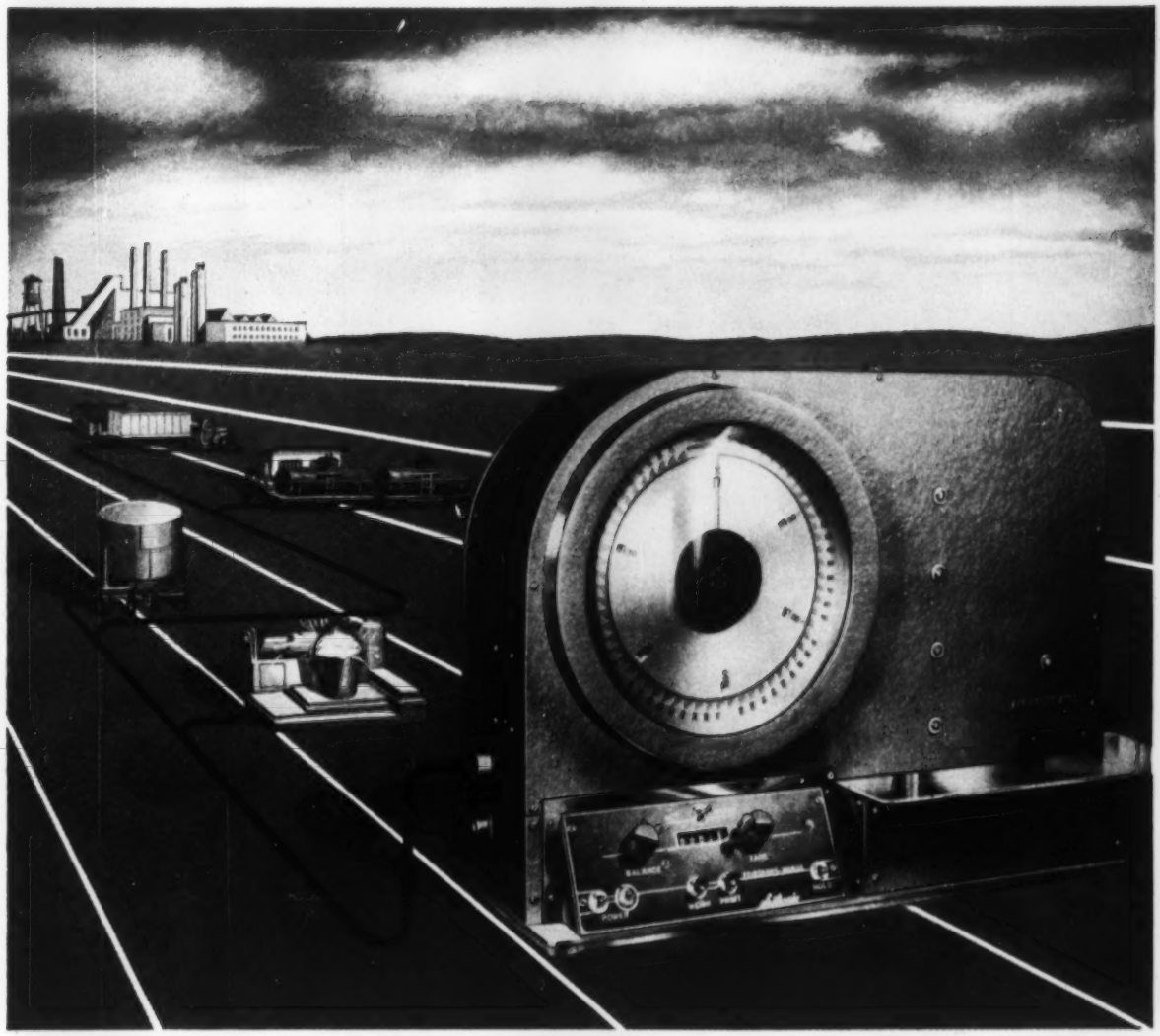
There is also reduced consumption of abrasive material due to steel shot's resistance to breaking up. Drum shop operators report that the rebound characteristics of shot are particularly helpful in cleaning the insides of drums.



SHOT-BLAST FOR BONDING
. . . less resin to cover finish

The Condition—Sticky or viscous deposits must be burned or washed out before blast cleaning, even when using grit. With shot, dry paint coatings must also be burned prior to blasting, if they are of the asphalt-base variety. Normally, dry paint can be blasted off without prior treatment, but this particular type adheres to shot, contaminates it and causes a smutty finish to be left on drums.

A Wheelabrator airless blast cleaning machine, in use at Rosenbloom Barrel & Drum Co., Chicago, for cleaning the interior of drums, employs steel shot with a nominal particle diameter of 0.011 in. Up to 200 drums per hour can be cleaned by the unit.



Weighing takes a new perspective with Fairbanks-Morse Electronic Instruments

You can disregard intervening walls . . . read and record weight indications hundreds of feet from the scale platform . . . enjoy greater flexibility and convenience . . . with a Fairbanks-Morse Electronic Weighing Instrument.

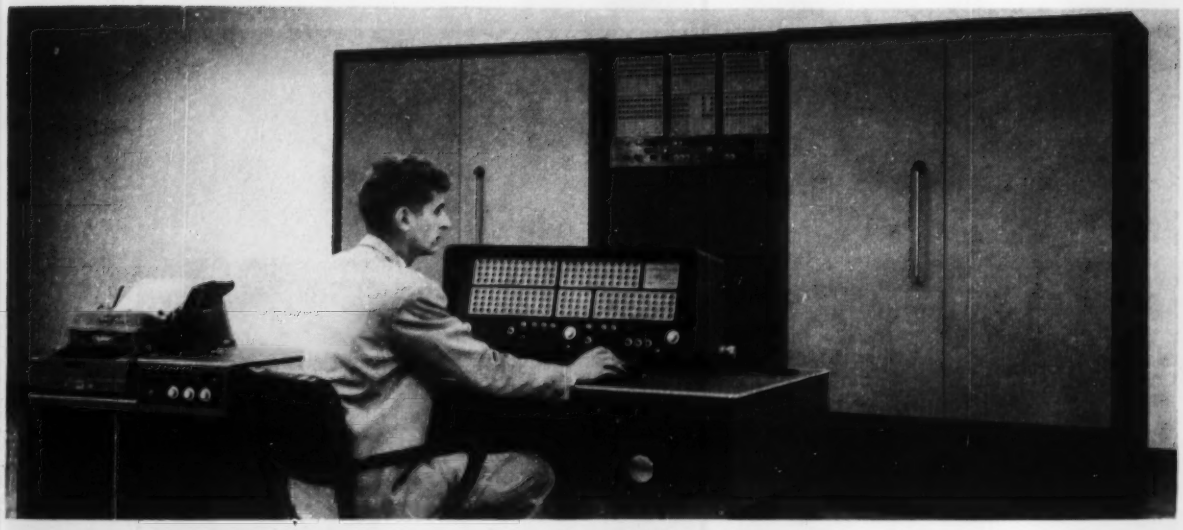
These are but a few of the countless new vistas opened to you. A compact Fairbanks-Morse electronic instrument enables you to check incoming trucks, supervise batching, monitor continuous-flow weighing . . . without leaving your desk.

Your nearby F-M Weighing Engineer can recommend electronic equipment without prejudice . . . because Fairbanks-Morse makes dependable scales of all types. Call him today for complete information, or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE

a name worth remembering when you want the best

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



At California Institute of Technology's jet propulsion lab, ElectroData's electronic digital computor aids engineers and scientists in processing numerical data generated by rocket motor test cells and wind tunnels

Computers: Their Practical Side

You may find yourself in the market for electronic computor equipment before you think. They're concentrating on practical adaptations, even for smaller plants

IN THE computer's short history, much of the talk about its potential has been out in the blue. Now producers are concentrating on the equipment's practical applications.

One, ElectroData Corp., has a course for the prospective customer's management and technical people. Heavy emphasis is placed on practical manufacturing adaptability. The Consolidated Engineering Corp. affiliate outlines some convincing reasons why these classes of firms can make computers pay: 1. Those with as few as 500 employees. 2. Those with 50 or more people in production control. 3. Those with 4000 to 5000 different parts in production.

Inventory Control — In production, probably the most important use is in parts inventory control. This places inventory information, normally contained in stock cards, on a magnetic tape. Punch card equipment is used to put in and take out data from the computer when inventory changes are made. These changes are indicated on the punch cards and are fed into the computer.

The computer can be set up so that when parts available from inventory become zero, it automatically indicates the need for reorder. It can be set up to print an order automatically, including name of vendor, without assistance. According to ElectroData, the computer not only means instant review of the complete inventory situation, it requires less equipment than a straight punch card setup.

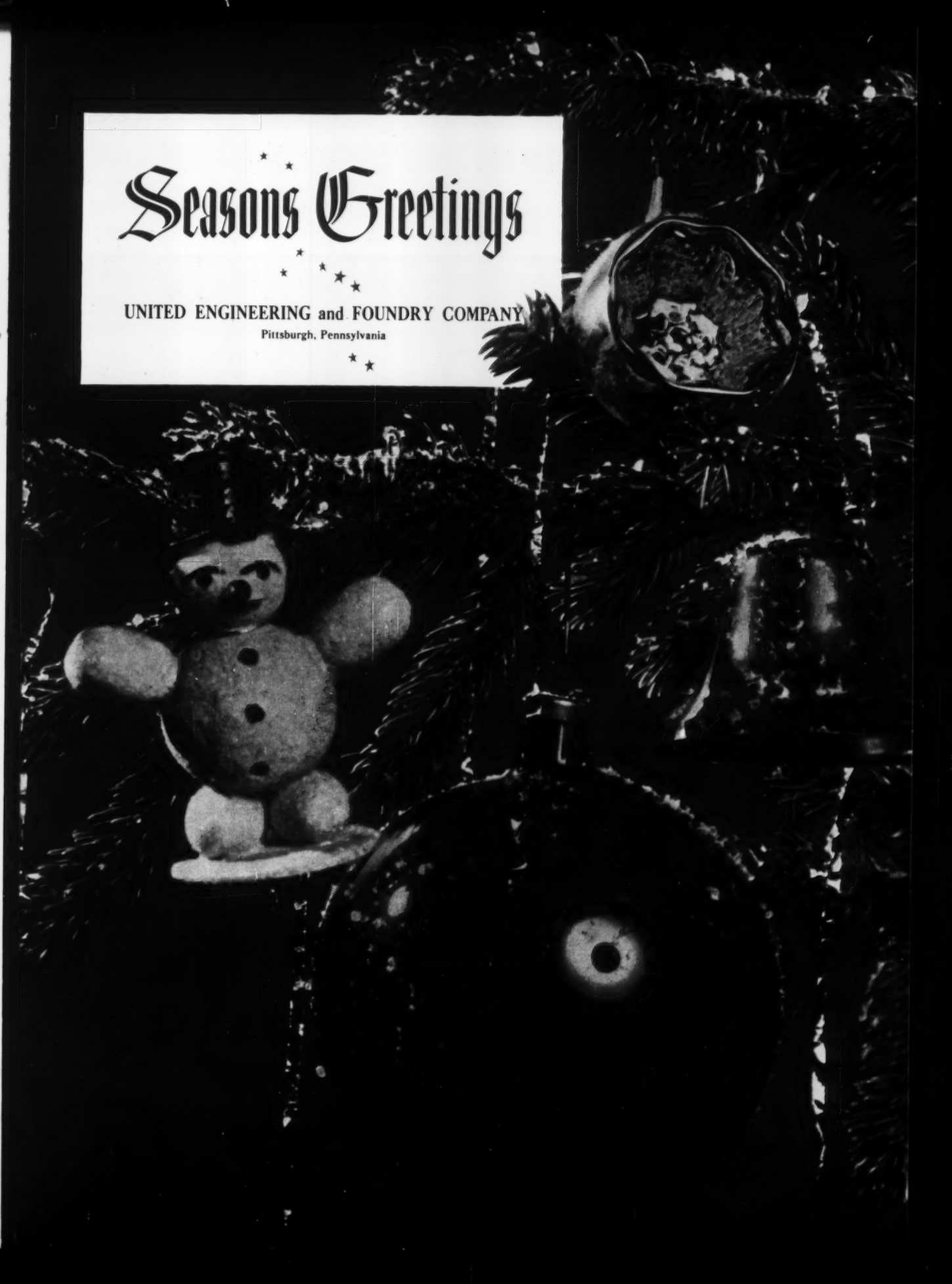
Scheduling — Often you can schedule an individual part with a computer. It's done by determining machine and waiting times for each operation. Waiting time is figured by average backlog and is obtained from an average of past records.

Required completion date is fed into the computer—which reviews the schedule backwards and automatically prints the due date for each operation until a starting date is determined. From this information, you can schedule all parts of a complex piece of equipment and have them all combined in proper sequence and on time.

Parts Requirements—Determining the number of parts for a new production run can be complicated. Done by computer, a typical computation and listing of parts requirements for an average end product might require only 15 to 30 minutes. The result is to keep computing backlogs to a minimum.

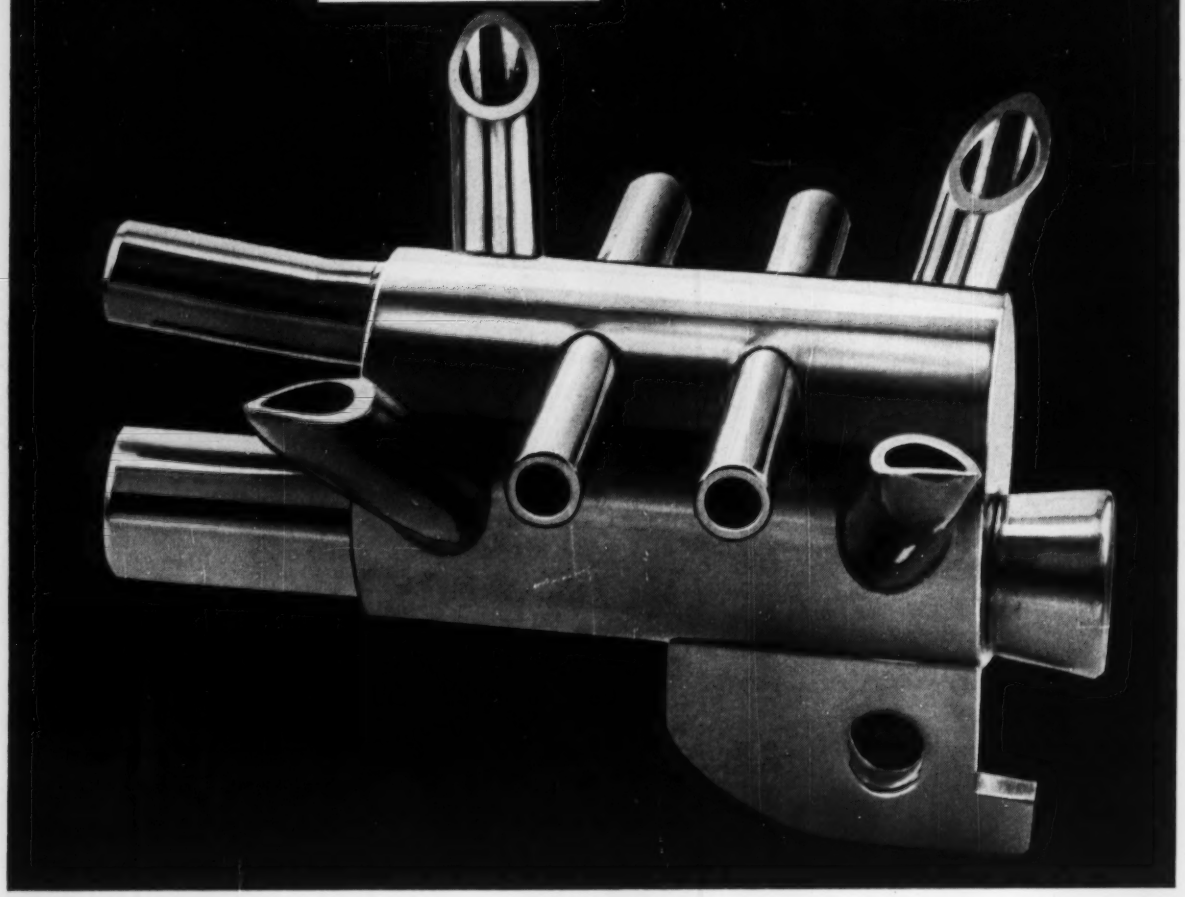
The magnetic tape contains the identification of every product made and every part for every product. Taped information is transfered to the memory drum, then number of each type of finished product required is fed into the computer. It automatically multiplies the number of each part required for a single finished unit by finished units desired.

After the automatic electric typewriter tabulates a list containing total number of each part required, your production run is established.


Seasons Greetings
UNITED ENGINEERING and FOUNDRY COMPANY
Pittsburgh, Pennsylvania

To Add Functional Buy-Appeal to Your Product

Switch to *Carpenter* Stainless Tubing



Appearance is important to any product, of course. An example is the milking machine manifold shown above. But there are more reasons for specifying Carpenter Stainless than its shining beauty.

Long-life and corrosion resistance, for example—excellent strength for weight ratio, workability, ease of machining, brazing and welding. And when you call for Carpenter you get some important "extras". *Uniformity* of dimension, analysis, concentricity from length to length and order to order is one of them. Another is Carpenter's *availability*. Adequate distributor stocks in key areas coast to coast, plus Carpenter's "cross stock availability plan" insures delivery of the tubing or pipe you need, when and where you need it.

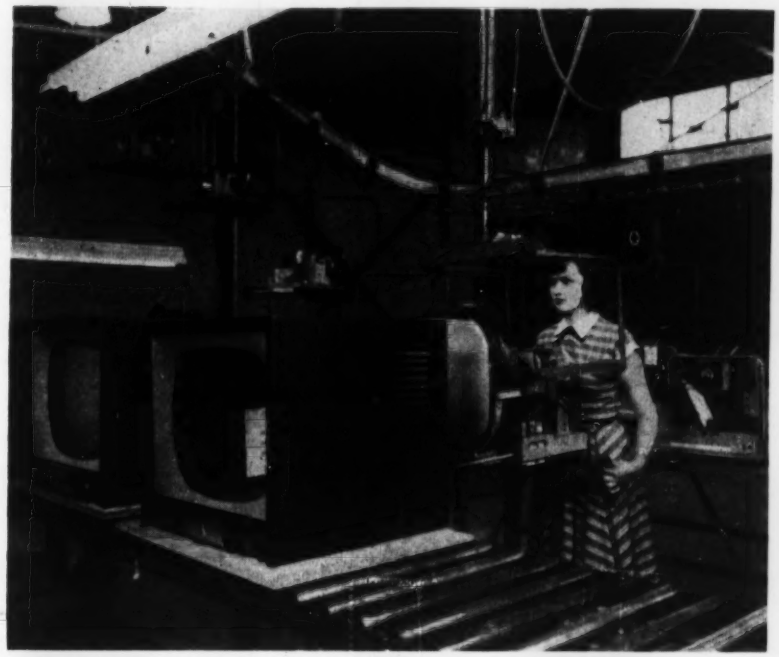
For more complete information on Carpenter Stainless Tubing and Pipe, write today for the new Condensed Data File. It contains data on physicals, analyses, dimensions, weights, tolerances and fabrication.

The Carpenter Steel Company, Alloy Tube Division, Union, N.J.
Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

Velvet-Glove Handling Speeds TV Line



Special handling device makes fitting of TV chassis into cabinets simpler and safer. Air-operated, the device cuts chances of damage to the sets from manual lifting. A conveyor delivers the chassis to the cabinet

A touch of the control button and compressed air elevates the set to a vertical position, where the chassis is easily bolted to the cabinet. A similar compressed-air-operated device handles the console models

NEW PLANT, new equipment, new assembly techniques — Canadian Westinghouse has gone all-out to make its television plant at Brantford, Ont., "the most." Here are some of the things they did to put production into high gear.

Quality control was one of the first departments established. It soon had a transformer department to watch over. By producing transformers ahead of schedule, the company built up inventory, didn't need to purchase those components from outside.

Speedy Hookup — Printed circuits were adopted—copper foil bonded to plastic. Holes are punched in the plastic to receive leads from components mounted on the circuit back.

Dip soldering eliminates the human element in fastening component leads to the circuit panel. Trays of assembled circuit units are carried by a belt through a solder bath.

Circuits are inspected in a device where signal lights warn the checker of any part missed in testing.

Gently Does It—Iron-hand-in-velvet-glove techniques show up especially in the chassis and cabinet handling equipment. The two units are fitted together and upended for bolting by devices that cut down labor and the chance of damage to the set.

Winding high-voltage secondaries for TV power transformers is one of the first operations in building subassemblies. This machine winds transformer secondaries ten at a time

(Advertisement)

Throughout America, industry improves production, thanks to *GAS*

This is an open hearth furnace, fired by natural gas, at the International Nickel Company. Here, during the initial step in the production of malleable nickel for processing into commercial forms, Gas is used because it economically produces temperatures around 2900°F. Later, Gas works as a production line tool, insuring the bright finish of the metal and softening it in a continuous annealing furnace for further processing. This flexibility, plus its cleanliness, economy, and dependability, makes Gas the satisfactory method of heat processing. That's reason enough for discussing your problem with your Gas Company's industrial specialist.

American Gas Association.

NEW PRODUCTS and equipment

Reply card on page 107 will bring you free literature, editorial clips or more infomation on new products and equipment described or advertised in this issue.

Redesigned Centerless Grinder

The No. 2 Filmatic offers greater operator convenience, quicker setup and closer limits of grinding accuracy.

Filmatic bearings have been retained for the grinding wheel spindle. Self-adjusting, they are automatically lubricated with filtered oil from a circulating system and protected with an electrical pressure switch.

A lower slide unit, mounted on bed ways at right angles to the grinding wheel spindle, supports an upper slide unit which carries the regulating or feed wheel. The work rest is mounted on the lower slide where it can be readily positioned in proper relation to the two wheels.

The regulating wheel is driven by a built-in 1½ hp motor through a back gear combination and a V-belt. Regulating wheel speeds are infinitely variable within 11 to 320 rpm. Speed changes are made with variable pitch sheaves.

Power operated profile truing is standard equipment. It is actuated by a hydraulic motor at one end of the unit. There are two external controls. Wheel truing is regulated through a straight hand screw type unit.

Motor and electrical controls are completely enclosed. The machine is wired to J.I.C. standards. Pushbuttons are on the front of the bed at the operator's working position. Cincinnati Grinders Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 1

Sheet Blasting Machine

. . . cleans both sides at once

Model ES-492 will clean both sides of steel sheet and plate simultaneously, in widths up to 60 in., at a cleaning rate of 60 to 100 sq ft per side per minute. Four standard Rotoblast wheels are capable of throwing 112,000 to 132,000 lb of abrasive per hour. Wheels are set over 12 degrees from the vertical, causing the abrasive to strike the sheet at a 78-degree angle so a continuous stream strikes the sheet.

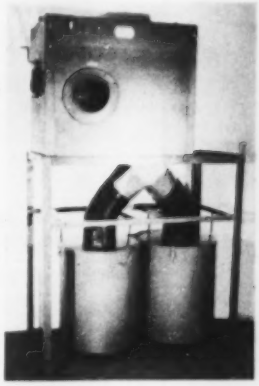
The rubber-covered idler rolls on the work conveyor drive carry the sheet through the blast machine. They're not driving rolls and can be lifted out through access doors and replaced. Pangborn Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

Dust Collection Unit

. . . revised design

Dustkop model 11w50's over-all height has been reduced by about 10 in. through elimination of the



standard dust bin. Filtered dust, shavings, chips or lint drop directly into selected collecting roller cans. The two roller cans, plus the diversion Y, have greater ca-

Seam welders welding aircraft parts

BUILDING RESISTANCE WELDERS INTO PRODUCTION LINES IS A TAYLOR-WINFIELD SPECIALTY

● How many welders do we need? What KVA for each operation? Press welders, projection welders, seam welders, butt welders? What type of operation? Why not call on the experience of Taylor-Winfield?

Taylor-Winfield can supply specific information about your production. For this practical help, "Call in T-W" and gain the benefit of facts, figures and experience with resistance welding.

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TAYLOR-WINFIELD
RESISTANCE WELDERS

THE TAYLOR-WINFIELD CORPORATION WARREN, OHIO

NEW PRODUCTS and equipment

pacity, providing a cleaner and more airtight system. Cans are said to have a better, more permanent seal, permitting dust to flow more freely and to settle faster.

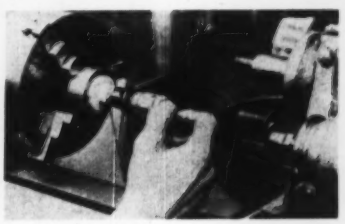
A new lid-closing principle makes connecting, disconnecting and removal of dust roller cans easier because of a new lid-closing principle. Lid and Y connections are self suspending during roller can removal and dumping. Aget Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Internal Micrometer

. . . sizes to fine limits

Irregular spacing of gaging pins (anvils) detects most forms of out-of-roundness. Pins are lapped to fit tightly, leaving no open keyway in the head to permit dirt to enter. It requires almost no



individual skill. The thimble that actuates the taper needle is spring-controlled, insuring repetition of measurement. The instrument uses a 10:1 needle taper.

Measuring heads of the Matrix Micro-Maag are interchangeable. Graduations on the thimble read directly from 0.00005 in. in small sets and 0.0001 or 0.0002 in. in the larger sets. Engis Equipment Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

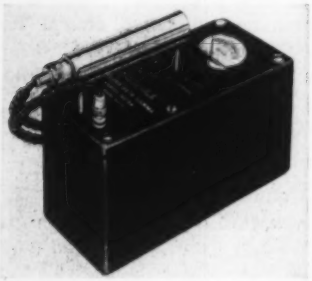
Survey Meter

. . . waterproof construction

SU-14 alpha beta gamma survey meter can be used as a radiation dosage rate meter and a monitoring instrument. A simple and inexpensive battery pack (having 150 hours of continuous life) uses standard D cells and 45-v batteries. High voltage for the G-M tube is provided by an oscillator.

A meter with two sets of scale ranges allows reading to be made in mr/hr and CPM. Scale ranges

of 0.25, 2.5 and 25 mr/hr and 500, 5000 and 50,000 cpm are pro-



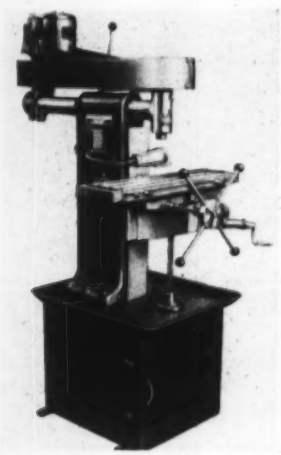
vided. Sensitivity drift is limited to 0.05 per cent per hour. Tracerlab Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Vertical Milling Machine

. . . rack feed

The model VM-1R machine features rack feed and a production milling attachment. Its longitudinal feed is 20 in. and is available



with Crowningshield head (as shown) or without. It is also available with the Bridgeport M head.

Other specifications are the same as VM-1 model. Crowningshield-Harris Co.

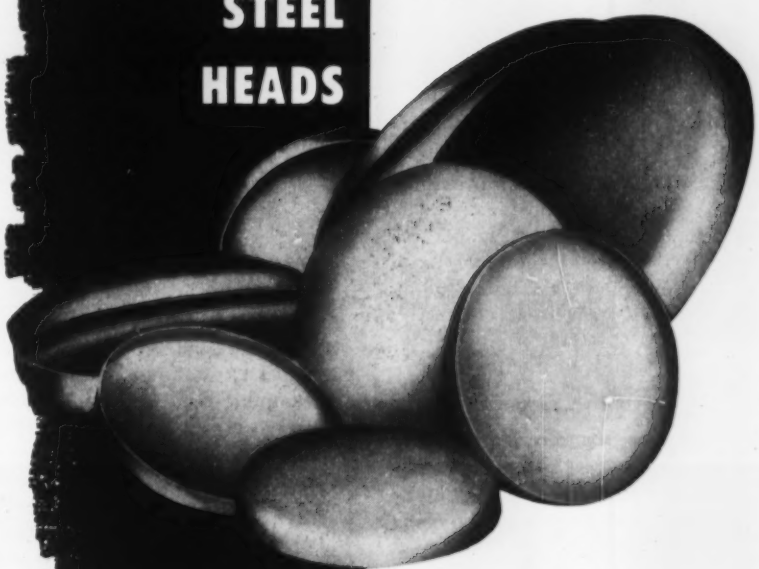
FOR MORE DATA CIRCLE REPLY CARD NO. 6

Combustion Control

. . . fully automatic

With particular application in soaking pits, annealing and reheating furnaces, the system makes optimum use of blast furnace gas, ratioing it with coke oven gas to provide a mixture with the necessary Btu content. The operator

"Heads-up" Service in STAINLESS STEEL HEADS



Fabricators rely on G. O. Carlson, Inc. for stainless steel heads produced to exact specifications and for other components of stainless steel tanks. Shells, flanges, rings, pads as well as spun or press-formed heads are readily available as a packaged service. This eliminates the need of multiple ordering from several suppliers and places responsibility in the skilled hands of Carlson specialists.

Carlson stainless steel heads are produced in a wide range of sizes and gauges to ASME and standard specifications. Many styles of forming dies are available. There's an up-to-date folder describing these dies—write for your copy now!

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G. O. CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

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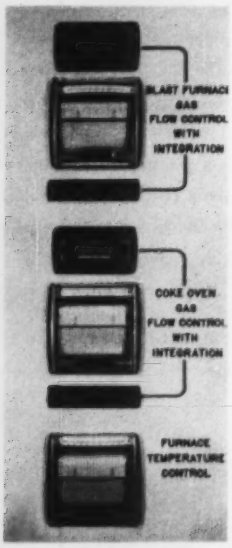
can adjust separate feed flows manually or switch to automatic control. He can readjust the automatic fuel ratioing mechanism as


BLAST FURNACE GAS FLOW CONTROL WITH INTEGRATION
COKE OVEN GAS FLOW CONTROL WITH INTEGRATION
FURNACE TEMPERATURE CONTROL

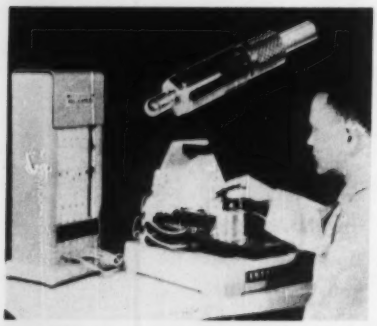
combustion conditions require. Furnace variables are continuously recorded on strip chart model 53 recorders used with model 58 Consotrol Controllers. Foxboro Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Gage

. . . inspects five dimensions

Plunjet gaging cartridges simultaneously inspect three outside diameters and two flange thick-



nesses on a cylinder. No special skill or calculations are required to use the gage. The operator places the part on the serrated worktable, slides it forward into gaging position and instantly checks five dimensions. The floats in the five air columns indicate which dimensions are within tolerance or the amount off.

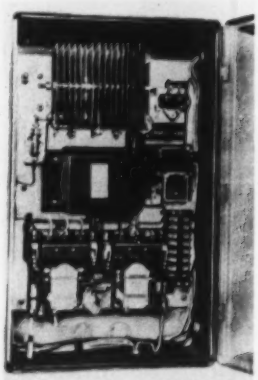
The gaging cartridges on the Precisionaire gage are about ⅜ in. in diameter by 1½ in. long. They're easily mounted and can be used to measure internal and external dimensions, as well as flatness, concentricity, runout, etc. Sheffield Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

Braking Controller

. . . pushbutton operated

This dc controller (available in two enclosure sizes) is for braking standard induction motors from ¼ to 25 hp. It will provide braking torques up to eight times full load running torque. It's operated from a single start-stop



pushbutton. Main components are a selenium rectifier, contactors, transformer and a timing circuit.

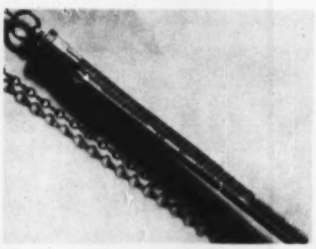
Direct current braking has such advantages as fast, accurate stopping, no need for a double-shaft motor and solenoid hum is eliminated. The motor cannot reverse. No external motor resistance is required. Westinghouse Electric Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

Cleanout Indicator

. . . accurate check

This instrument tells the exact condition of solvent in the de-



greaser. Calibrated for both trichlorethylene and perchlorethylene solvents, the Ramco cleanout indicator (about the size of a fountain pen) is easy to read.

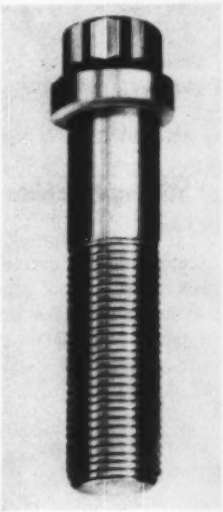
It comes complete with a performance and control chart. Ramco Equipment Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Socket-type Screw

. . . external wrenching

Countr-Bor is designed to fit any socket head screw application.



External wrenching, with the standard 12-point socket wrench and increased wrenching area, result in greater wrenching torque. A special hexagon key is not required. Ferry Cap & Set Screw Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

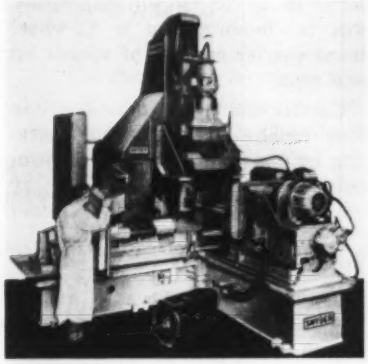
Drilling Machine

. . . four-way, automatic

Designed for processing 30-in. long cast-iron tractor transmission cases, the machine drills holes in the left and right hand sides and in the bottom and rear of the part. It consists of four self-contained hydraulic feed drill units, one vertically-mounted and three horizontally. These are arranged around the work-holding fixture, and all carry multiple spindle heads. Guide fingers and approximate locators assist the operator in guiding the part down into an approximate clamping position. Final location is made by pilots.

Work cycle is automatic after loading and starting. The machine is electrically interlocked through-

out to protect the operator and machine. Tools are high speed steel operating at 80 sfm. Feed speeds vary with the head. All



sliding and rotating surfaces are lubricated from a central system through a manually operated pump near operator. Snyder Tool & Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Work Positioner

. . . spring type

Designed to provide a worktable that positions to desired height, this mobile unit adjusts by a series of calibrated springs. The table travels vertically along channels. Distance of travel is controlled by the number of springs attached. Each spring is calibrated to 100 lb capacity. Capacity of the unit is changed by removing or adding springs.

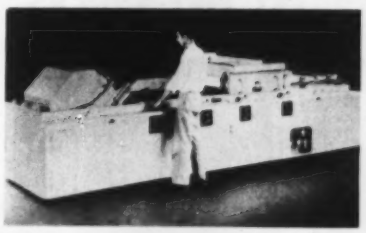
The standard work positioner has a capacity of 1000 lb and will move loads up to or down from the 42 in. level above the floor. Dimensions are 24 x 36 x 60 in. Table bed is 24 x 30 in. Rack Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Shell Molding Machine

. . . for 24 x 36 in. patterns

This machine, incorporating two stations, is similar in general arrangement to the 14 x 18 in. model. It uses hydraulic power for the



pattern and dump box at each station, which has a separate hydraulically-powered shell ejection plate. The plates are adjustable for deep draws.

The curing oven is radiant heated and contains cam-actuated doors that close automatically at each end of the pattern frame during curing. Both investment and curing cycles are controlled by automatic reset electric timers. Shallway Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Conveyor

. . . simplifies order spotting

The Flex-A-Tail unit speeds and simplifies order spotting on the

loading dock. It employs a permanently mounted Flex-A-Joint, with a flexible assembly of split rollers moving on a stationary slider bed. A portable mounted tail section of the wheel or roller gravity conveyor is attached to the Flex-A-Joint. The receiving end is attached to the discharge end of the shipping room conveyor, and the tail section extends onto the loading dock where it can be moved through an 80-degree arc.

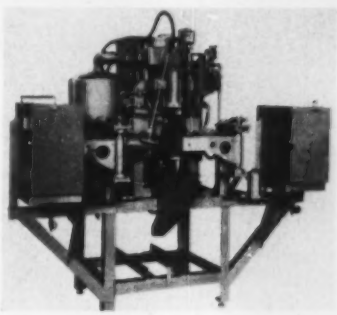
It's available in 11½, 15 and 18-in. widths, in wheel or roller models, with tail sections up to 25 ft. Couplings for attachment to Bushman, Rapistan and other standard gravity conveyors are furnished when required. Metzgar Conveyor Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Hollow Core Machine

. . . two-station

One operator makes finished cores without the use of separate dryers or core ovens. The machine can be installed as an integral unit in molding machine production



lines because cores are ready to use when removed from the core boxes. Model 10 has twin ovens and twin core box mounts. It accommodates boxes up to 10 x 10 x 6 in. and makes finished cores in a 45-second cycle. All operations are automatic, except positioning of boxes and removal of finished cores.

A plastic collector pan is laid in the angle frame under the chute when machine is operating. SPO Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

Wagon Cranes

. . . diesel-electric

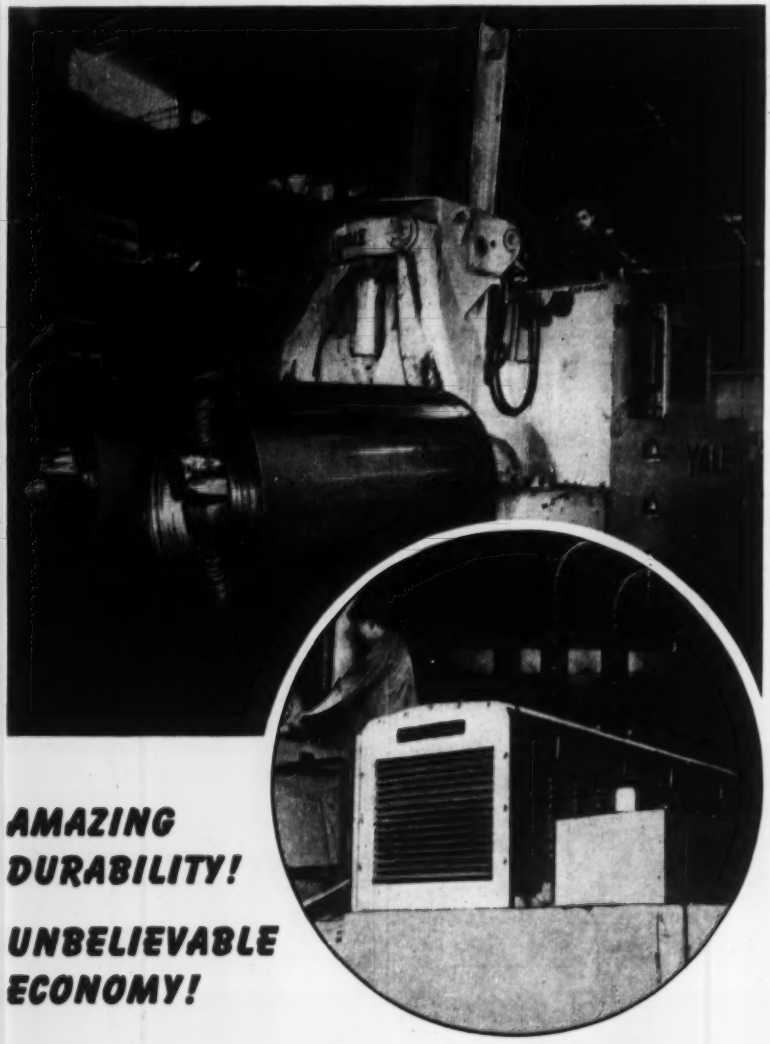
The first of the rubber-tired mobile cranes, a 30-ton model, has

a 60-ft boom, a diesel engine rated at 165 hp at 1800 rpm, dynamatic master clutch and antifriction

Ready-Power Continuous-Duty

DIESEL ELECTRIC

POWERS INDUSTRY'S LARGEST LIFT TRUCKS



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The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

NEW PRODUCTS and equipment

bearings in all essential steering places. It employs both electric travel and electric rotation. The wagon cranes, now being manufactured in 25 to 60 ton capacities, will be mounted on a 12-wheel crane carrier capable of speeds up to 8 mph.

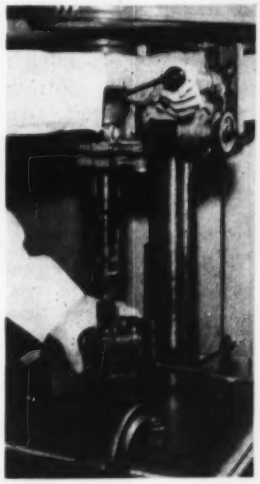
Carrier and crane controls are in easy reach. Design is for operation by one man. Industrial Brownhoist Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 17

Torque Wrench

. . . magnetic release

Operating first as a nut runner, Pow-Or-Tork runs a fastener down functions as a torque wrench until the fastener reaches a predetermined torque, then automatically releases. Its continuous and fully automatic operation eliminates inaccuracies by overcoming alternate static and dynamic friction during tightening cycle. Distortion and breakage of parts by under or over reading of desired tension are also eliminated.



It's available in mechanically-supported single and multispindle wrenches for any bolt pattern. Sizes range from those suitable for clocks and instrument assembly to large industrial applications. Operation can be designed for air power, standard 60-cycle or high-cycle use, with magnetic or air differential release. With air differential release, torque can be remotely controlled. Ohlsson & Rice Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 18

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Lathes

Cincinnati Lathe & Tool Co.'s "Management Facts . . . About Lathes" presents, in capsule form, pertinent data on its tray-top and LT lathes—4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 19

Wavometer

Micrometrical Development Corp. describes its Ball Wavometer, an inspection instrument for measuring the waviness of balls from 1/16 to 1¼ in.—Bulletin B-1.

FOR A FREE COPY CIRCLE REPLY CARD NO. 20

Test Unit

North American Philips Co. Inc. describes an economical method for checking ferrous metal objects for surface discontinuities — 6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 21

Processing Equipment

Buflovak Equipment Division, Blaw-Knox Co. shows its line of equipment for processing food products, pharmaceuticals, chemicals and for by-product recovery—Catalog No. 363.

FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Pyrometers

Bristol Co. covers its line of millivoltmeter pyrometers and accessories—Bulletin P1244.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

Flat Rolled Steel Product

Alan Wood Steel Co. covers "A. W. Dynalloy," a low alloy, high strength flat rolled steel product —Booklet D-78, 8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 24

Carbon Control

Surface Combustion Corp. covers the Autocarb System which automatically controls carbon potential in continuous and batch furnaces —SC-168, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 25

Precision Instruments

PIC Design Corp. lists its precision instrument components and parts immediately available from stock—Catalog No. 5, 64 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Clutch Catalog

Formsprag Co. includes photos, application drawings, engineering and specification data for each clutch in its standard lines—Catalog No. 102, 19 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Control Systems Care

W. F. & John Barnes Co. outlines a new approach to simplify maintenance of complex electrical control systems—8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Castings

Sandusky Foundry & Machine Co. covers its range of compositions and products. A second bulletin (136) lists specifications for its shower pipes—4 pages each.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Refractory-Fiber Felt

Johns-Manville has issued a folder on Thermoflex, a multi-purpose refractory-fiber felt for service to 2000°F—6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Welding

Arcos Corp. details a welding technique (EB Weld Insert process) permitting deposition of a root pass that produces a smooth and uniform weld surface even though welding is done on one side only—10 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Pneumatic Controllers

Minneapolis-Honeywell Regulator Co. lists specifications for ElectroniK circular chart pneumatic controllers—Specification 163-1.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Tools Catalog

R & L Tools lists its turning tool, carbide or roller backrests, releasing or nonreleasing tap and

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For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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Electric Eye

ESS Instrument Co. describes use of photoelectric instruments for the detection and control of smoke and haze and Hazegage Indicators and controls that monitor or control fuel-air—Bulletin 532, 7 pages.

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Cutting Tools

Putnam Tool Co. offers a listing of its line of standard cutting tools.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Business Language

American Management Association's film shows how firms can mechanize business offices by using a common language for all office machines—1 hr, 16 mm sound.

FOR A FREE COPY CIRCLE REPLY CARD NO. 36

Pillow Blocks

Tann Corp.'s Congress Drives Division describes its line of low cost, self-aligning pillow blocks and flange bearings—Bulletin PB-54, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 37

Fastener

Townsend Co.'s Tuff-Tite multipurpose fastener with a one-piece metal head and preassembled neoprene washer is featured—Brochure TL 97, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 38

Zinc Die Casting

Page & Hall Mfg. Co. Inc.'s "Intricate, Small Zinc Die Castings" describes a process that makes it possible to produce small quantities of die castings economically —4 pages.

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Rubber, Vinyl

Sun Rubber Co. covers facilities used to produce its conventional and special rubber articles—20 pages.

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Hand Trucks

Magnesium Co. of America uses photographs to show design, construction features and on-the-job applications of its redesigned hand truck line.

FOR A FREE COPY CIRCLE REPLY CARD NO. 41

Hoisting Equipment

Yale & Towne Mfg. Co. pictures and describes its Cable King line of wire rope electric hoists—Brochure P-495-A, 16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 42

Hand Lift Trucks

Market Forge Co. offers a comprehensive and colorful new check chart of features to look for in the selection of hand-lift and hand-pallet trucks—Bulletin 1005-A, 6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

EDITORIAL REPRINTS:

Appliances for '55

Profits will stay about equal with 1954's, though unit sales will be up about 10 per cent. This is because the competitive buyers' market will further compress profit margins. The article on p. 41 tells how industry shapes up for the start of 1955.

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Roll Bonding

Roll bonding offers a solution to shaping and forming metals and alloys that are difficult to produce by ordinary ingot rolling practice. This method produces powdered metal at a price competitive with ingot, p. 76.

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Industrial Television

With some problems, such as size licked, suppliers are making progress selling the idea. Industry is willing to foot the bill, if there are enough advantages. There's an account of what suppliers have been doing on p. 74.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Blast Furnace Practice

The substitution of volatile-free magnetite ore for volatile-bearing reduces heat requirements for preparing ore for smelting. On p. 84, the thermal effects are discussed in detail.

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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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12-20-54

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Market Outlook

THE URGE to get as many automobiles as possible off the production line in the next three or four months is adding a fillip to steel demand.

Two spurs to auto output are: 1. The threat of an autoworkers' strike at the end of May. 2. The production and sales race between Chevrolet and Ford.

CHAIN REACTION—To put auto production at the highest level in over a year, automakers have had to step up the flow of steel to them and also strengthen inventories. This increased pressure of demand for steel has prompted other consumers of light, flat-rolled steel to expand their ordering and inventories. There's considerable belief that some steel consumers are buying steel faster than they are using it. That certainly would be natural. Whenever you think it's going to take a little longer to get something you lay in an extra supply just so you won't run out if deliveries don't come through.

In response to these demand factors, steel ingot output held steady at 81.5 per cent of capacity in the week ended Dec. 19.

STRONG POINT—Much of the strong rise in steel demand centers in cold-rolled sheets. Some producers are sold out for first quarter of 1955 and are feeling obliged to resist customers' attempts or inclinations to order more than they need. This scrutiny of orders has not led to resumption of quotas, but one producer of cold-rolled sheets says it is the closest to quotas it has been for a good many months.

Although the automotive demand is felt most strongly in cold-rolled sheets, it is not confined to them. Producers of other forms of steel, such as bars and wire, are benefiting, too.

"FOREIGN AID"—Strengthened domestic demand is not the only good fortune that has come to steel producers in the United States. They're witnessing a rise in steel demand in Europe. This helps U. S. producers two ways: It evaporates some of their foreign competition. It brings demand from Europe.

Reflecting expanded demand and sharply extended delivery promises in Europe, prices on European steel are advancing sharply (p. 124). Still higher prices are expected before the year end. In addition, ocean shipping rates may be raised $1 to $1.25 a ton Feb. 1.

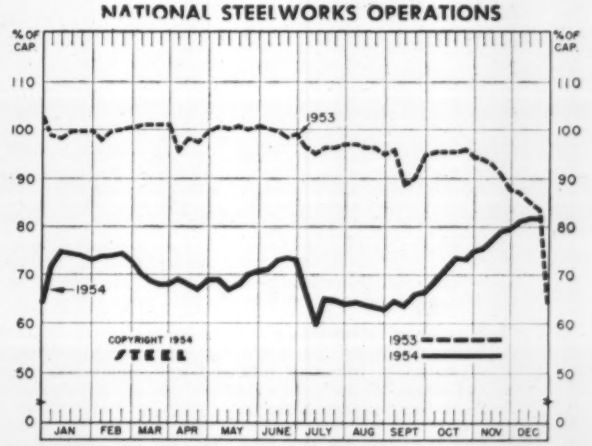
With delivery promises extended on European steel, many foreign consumers of it are inquiring in the U. S. for steel.

UPWARD TREND—In the U. S., prices of domestic steel continue firm, so firm that any changes are inclined to be on the "up" side. Nickel-bearing grades of stainless steels and certain other alloy steels are dearer because of the rise in price of primary nickel. U. S. Steel Corp. says the over-all effect of its price changes on stainless is less than 2 per cent, less than 1 per cent on alloy steel.

Another ingredient of alloy steels—molybdenum—has gone up. It rose about 10 per cent.

Gains in stainless and alloy steel prices do not affect STEEL's price composite on finished steel. It remains at $117.95 a net ton. Further softening of scrap prices lowered STEEL's price composite on steelmaking grades to $32.42 a gross ton from the preceding week's $32.58.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Dec. 19	Change	Same Week 1953	Same Week 1952
Pittsburgh	77	— 1*	90	104
Chicago	87.5	— 3*	94	111
Mid-Atlantic	75	+ 1	85	101
Youngstown	87	+ 1	82	106
Wheeling	86	—10	91	100
Cleveland	96.5	+ 0.5*	80.5	110.5
Buffalo	100	0	88	106.5
Birmingham	67	+ 1.5	70	108
New England	70	+ 3	75	89
Cincinnati	71.5	+ 3.5	73	93
St. Louis	79	— 1	88	101
Detroit	75.5	+ 1.5	98	103.5
Western	87	+ 4	88	107
National Rate	81.5	0	83.5	105.5

INGOT PRODUCTION‡

	Week Ended Dec. 19	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	121.0†	121.9	117.8	118.3
NET TONS (In thousands)	1,944†	1,958	1,892	1,900

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 33 Technical Outlook—p. 73

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Dec. 14 1954	Dec. 7 1954	Month Ago	Nov. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 14

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.775
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.000
Bars, reinforcing	5.050
Bars, C.F., carbon	5.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.880
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.549
Sheets, electrical	$9.350
Strip, C.R., carbon	7.507
Strip, C.R., stainless, 430 (lb)	0.416
Strip, H.R., carbon	5.125
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.546
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.74	152.52
Index in cents per lb.	5.270	5.270	5.270	5.140	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.95	$114.95	$91.64
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	32.42	32.58	33.67	32.00	28.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 15 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.36
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.00
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.00-4.15
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.75
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, ½-⅝" Pitts.	4.675	4.675	4.675	4.525	3.40
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	46.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$32.50	$32.50	$34.50	$33.50	$31.00
No. 1 Heavy Melt, E. Pa.	31.75	32.25	33.50	31.00	24.75
No. 1 Heavy Melt, Chicago	33.00	33.00	33.00	31.50	29.00
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	29.50	31.75
No. 1 Heavy Melt, Cleve.	32.50	32.50	32.50	29.50	29.75
No. 1 Heavy Melt, Buffalo	30.50	30.50	32.50	29.50	29.75
Rails, Rerolling, Chicago	52.50	52.50	54.50	42.50	43.50
No. 1 Cast, Chicago	39.50	39.50	39.50	33.50	37.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

Daily Nonferrous Price Record

	Price Dec. 15	Last Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.750
Lead	14.80	Oct. 4	14.55	14.800	14.775	13.300
Zinc	11.50	Sept. 3	11.00	11.500	11.500	10.000
Tin	89.25	Dec. 15	89.375	91.196	93.110	84.913
Nickel	64.50	Nov. 24, 1954	60.00	60.900	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.200	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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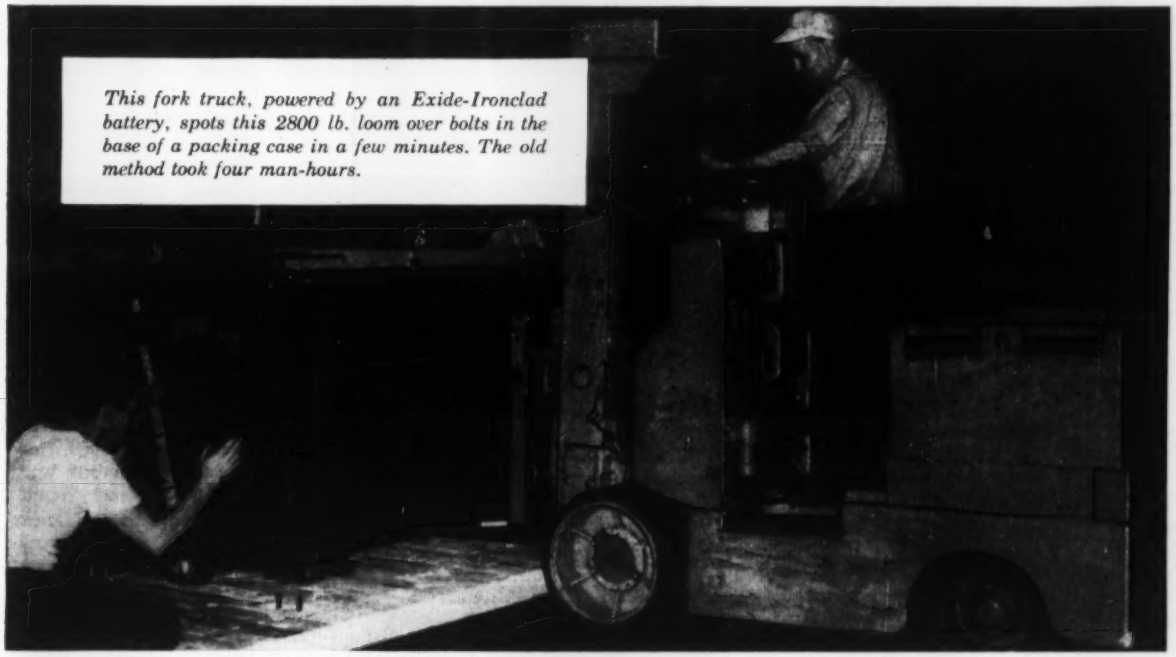

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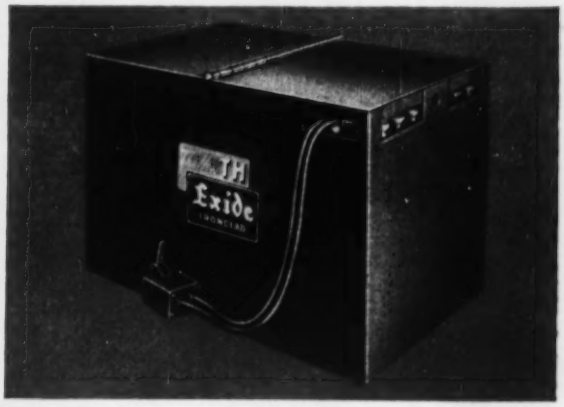

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Nonferrous Metals

Growing trend to continuous galvanizing lines is causing shift from prime western to "specification grade" zinc. Production and pricing will come in for some close scrutiny

Nonferrous Metal Prices, Pages 114 & 115

A QUIET UPHEAVAL is taking place in the zinc industry, one which will have profound effect on production and probably the pricing structure of the age-old metal.

Zinc's best customer, the galvanizing industry, is shifting its requirements from prime western grade zinc to "specification grade," with the growing trend toward continuous galvanizing lines. To date, close to 30 continuous galvanizing lines have been built or are planned. They call for zinc of higher purity than prime western, generally in the brass special or intermediate classifications.

Metallurgy — For their continuous lines, galvanizers prefer zinc of low lead content (0.2 to 0.65 per cent) and controlled cadmium content. To this is added 0.10 to 0.25 per cent aluminum to suppress formation of a brittle alloy layer between zinc and iron. (Elimination of the brittle layer means a tight coating that won't flake or crack, opening up new applications for galvanized steel.)

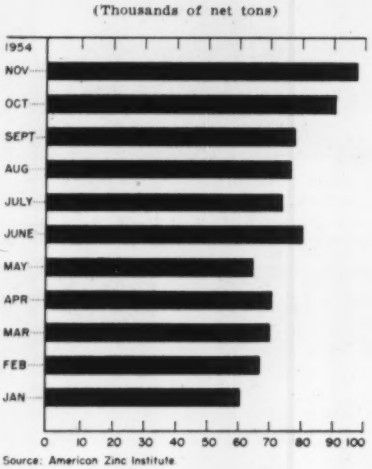
Prime western zinc contains a maximum of 1.60 per cent lead, while brass special contains 0.60 max, intermediate grade 0.2 per cent. Some zinc men hope the numerous temporary specifications for continuous galvanizing metal can be resolved into one or two standard compositions in the interest of lower cost to the consumer. Most galvanizers prefer to keep their coating formulations to themselves, paying a premium for higher-purity zinc and adding aluminum at point of use.

Production Problems—Prime western has long been the kingpin grade of zinc in tonnage produced. Galvanizing is its largest outlet, and its displacement would bring several problems. Producers could upgrade prime western by mixing it with higher purity metal or put it through additional refining procedures. Here retort operators will have more of a problem ridding the metal of high lead content than users of the electrothermic process.

The price of zinc has always been pegged to the prime western base. With its decline in importance, the often-discussed but little-practiced system of pricing each grade separately on the basis of specific supply and demand might revive. This move would undoubtedly be favored strongly by the die casters in particular.

Outlook Bright—In continuous lines no dross is formed and less zinc is applied to the metal. But more zinc will be used because of new applications opened up by the product. One recent estimate of market potential for galvanized sheets: 2.5 million tons per year. Wheeling Steel Corp.'s Nelson E. Cook has stated that there are a sufficient number of continuous coating lines in operation or under construction in the U. S. to service about 75 per cent of present demands for galvanized sheets and coils. Further, he believes all zinc-coated strip material will eventually be made by the continuous method.

Monthly Slab Zinc Shipments Climb To Seven-Year High



Source: American Zinc Institute

Galvanizing has been a bright spot in zinc use, with sharpest decline this year borne by brass mills and die casters. In the first nine months of 1954, total consumption of zinc was off 17.5 per cent from the same period of 1953, but galvanized sheet and strip business was up 6.6 per cent. Use for hot dip and job work was off 4.6 per cent. With brass mills and die casters appearing to have shaken their slumps and with galvanizing maintaining and promising to better its torrid pace, the outlook isn't nearly so dim as many picture it.

More Production Problems

Overproduction at the smelter level is still a problem for zinc men. The 80,119 tons turned out in November was the highest in more than a year. But heaviest domestic shipments in two years combined with increased government shipments to top a seven-year high mark and pull stocks down 17,479 tons. Going into December, stocks stood at 134,658 tons, backlog at 44,042 tons.

Aluminum Over the Top

Aluminum output this year will top 1953's by 16 per cent, with a turnout estimated at 1.45 million tons, Donald M. White, secretary, the Aluminum Association, predicted last week. New monthly and quarterly records were set, and with the "second round" expansion to be complete early next year with initial operation of Anaconda's reduction plant, 1955 is not likely to show such marked gains.

Shipments of semifabricated aluminum products, which had shown a considerable drop during the latter part of 1953 and early 1954 according to Mr. White, "registered a substantial recovery beginning in the second quarter, so that average shipments during the later months of the year compared favorably with the averages for the corresponding months of 1953." A notable exception: Aluminum foil, which will approach 75,000 tons in 1954 shipments, a gain of about 30 per cent from 1953.

Market Memos

- The copper and brass industry is selling direct to the consumer as well as industry through advertisements and promotion sponsored by Copper & Brass Research Association.
- All categories of aluminum product shipments increased in October from September levels except rod and bar, ACSR and bare cable and heat-treatable sheet and plate.
- Brass and bronze ingot makers are openly advertising price reductions on their products, further evidence of the farce in ingot pricing.
- General Cable Corp. will direct-extrude aluminum sheathing on its cable next year, with the installation of a new German extruding press.
- Sales of aluminum building products should climb to $600 million or higher in 1955, predicts Nichols Wire & Aluminum Co.

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Nonferrous Metals

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PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $110-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $10-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-pelletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J

Mercury: Open market, spot, New York, $315-$320, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $120-$130 nom. per troy oz.

Palladium: $18-$20 per troy oz.

Platinum: $81-$84 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $120-$125 per troy oz.

Ruthenium: $50-$55 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 89.25, prompt 89.25.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.50, grade A-2 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb nom., f.o.b. shipping point; less than 1000 lb $5.10 nom.; 99+% hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.25-22.25; No. 12 foundry alloy (No. 2 grade) 20.75-21.25; 5% silicon alloy, 0.60 Cu max., 23.50-23.75; 13 alloy 0.60 Cu max., 23.50-23.75; 195 alloy 22.00-23.50; 108 alloy 21.75-22.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.75-22.50; grade 2, 20.75-21.75; grade 3, 20.25-20.50; grade 4, 19.25-19.75.

Brass Ingot: Red brass, No. 115, 30.00; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.75; manganese bronze No. 421, 27.75

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91C, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy.) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb c.l.., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.156-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	65.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	35.6
0.076-0.061	12-48	36.7	33.8	36.8
0.060-0.048	12-48	37.2	34.1	39.3
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	90.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in. 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.0
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$515.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 14.50; low copper clippings 14.50; mixed clippings 12.50; old sheet 11.00; borings and turnings 7.50; pistons and struts 8.00; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Steamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.76b	46.36c	....	48.82	26.000	26.000	25.250
Yellow Brass	42.27	42.21d	42.81	45.18	19.875	19.625	18.250
Red Brass, 85%	45.89	45.83	46.43	48.70	23.000	22.750	22.250
Low Brass, 80%	44.95	44.89	45.49	47.76	22.250	22.000	21.500
Naval Brass	46.39	40.70	53.43	49.55	18.500	18.250	17.750
Commercial Bronze, 90%	47.38	47.32	47.92	49.94	23.875	23.625	23.125
Nickel Silver, 10%	56.30	60.68g	58.63	....	24.125	23.875	12.063
Phosphor Bronze, A, 5%	67.31	67.81	67.81	68.96	26.500	26.250	25.250
Silicon Bronze	53.09	52.28	53.13	70.49e	25.125	24.875	24.125
Manganese Bronze	50.09	44.25	54.70	....	18.500	18.250	17.750
Muntz Metal	44.54	40.35	....	....	18.750	18.500	18.000

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 26.00-26.50; No. 2 copper 24.50-25.00; light copper 22.50-23.00; No. 1 composition red brass 21.00; No. 1 composition turnings 20.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 15.50-16.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.75-16.00; 51S, 52S clippings 15.75-16.00; 14S, 17S, 24S clippings 15.00-15.25; mixed clippings 14.50-14.75; old sheet 13.75-14.00; old cast 13.75-14.00; clean old cable, free of steel 15.75-16.00; borings and turnings 14.00-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 28.50; No. 2 copper 27.00; light copper 25.50; refinery brass (60% copper) per dry copper content 25.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 28.50; No. 2 copper 27.00; light copper 25.50; No. 1 composition borings 23.25; No. 1 composition solids 23.50; heavy yellow brass solids 18.00-18.25 yellow brass turnings 17.00-17.25; radiators 19.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 5000-10,000 lb; electrodeposited 39.78, cast 42.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.085; 200-499 lb $1.07; 500-999 lb $1.065; 1000 lb or more $1.06.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

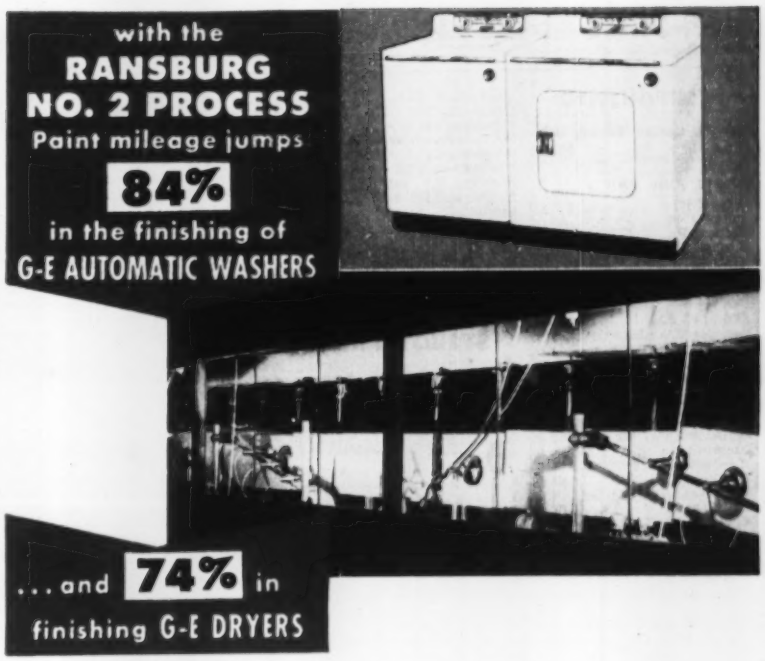
Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 69.6; 100-600 lb 55.4; 700-1900 lb 53; 2000-9900 lb 51.2; 10,000 lb or more 50.1.

Stannous Chloride (Anhydrous): Less than 50 lb $1.551; 50 lb $1.211; 100-300 lb $1.061; 400-900 lb $1.037; 100-1900 lb $1.013; 2000-4900 lb 97.6; 5000-19,000 lb 91.5; 20,000 lb and over 85.4.

Stannous Sulphate: Less than 5 lb $1.252; 50 lb 95.2; 100-1900 lb 93.2; 2000 lb and over 91.2.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.



Production is increased and quality of the work is improved over former hand spray method

● When General Electric formerly hand sprayed their home laundry equipment—automatic washers and dryers—they painted 9.74 washers with a gallon of paint. Now, in the new and modern plant at Appliance Park, Louisville—where they're using the Ransburg No. 2 Process—they get 17.97 units per gallon of paint. An increase of 84%!

And, where they formerly got 5.49 dryers per mixed gallon of finish, now—with the Ransburg No. 2 Electrostatic Spray Process—they get 9.56 dryers per gallon of paint. An increase of 74%!

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Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; Key on page 117. Key to footnotes, page 119.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....73.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$64.00
Bessemer,Pa. U5 .....64.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 .....64.00
Pittsburgh J5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 .....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....85.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Munhall,Pa. U5 .....78.00
Pittsburgh J5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 .....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....93.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago, R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 .....4.775
Munhall,Pa. U5 .....3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 .....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.675
Fontana,Calif. K1 .....5.475
Houston S5 .....5.075
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 .....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
SparrowsPoint,Md. B2..4.775
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.26
Geneva,Utah C11 .....4.25
Houston S5 .....4.65
Ind.Harbor,Ind. I-2 ...4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.85
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....3.95
Portland,Oreg. O4 .....5.00
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 .....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ...4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 ....3.95
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.80
Ind.Harbor,Ind. I-2, Y1..6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ...5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 .....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 ....4.226
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.375
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.226
GraniteCity,Ill. G4 ....4.426
Harrisburg,Pa. C5 .....3.975
Houston S5 .....4.625
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ...4.225
LoneStar, Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ....5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....6.125
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. R2 .....4.225
So.Chicago,Ill. U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 .....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 .....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....6.20
Ind.Harbor,Ind. Y1 .....5.80
Johnstown,Pa. B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 .....5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.45
Emeryville,Calif. J7 ...5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23....5.05
So.Chicago, R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Buffalo R2 .....5.075
Canton,O. R2, T7 .....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 .....6.125
Fairless,Pa. U5 .....5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.475
Ind.Harbor,Ind. I-2, Y1.5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 .....5.675
Lackawanna,N.Y. B2 ...5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2, U5, W14 5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS, H.R. Leaded Alloy

Warren,O. C17 .....5.825

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.85
Ind.Harb.,Ind. I-2, Y1...6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....4.85
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
KansasCity S5 .....5.80
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12, R2 5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 .....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ...6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ...6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 ....6.825
St.Louis,Mo. M5 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ....6.925
Youngstown F3, Y1 ....6.625

BARS, C.F. Leaded Alloy

Warren,O. C17 .....7.525
Cleveland C20 .....7.40

BARS, Reinforcing (To fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.70

Ind.Harbor, Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 P23 ..5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing

(Fabricated; to Consumers)

Johnstown,Pa., ¼-1" B2.5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh J5, U8 ....5.72
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ...6.00
SparrowsPt. ½-1" B2...5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa. (3) F5 ..4.20
Franklin,Pa. (4) F5 ..4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19.4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ...10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ...4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fairless,Pa. U5 .....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Houston S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6(38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburg,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 .....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3....5.00
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 ....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.65
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1 ..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ...7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 ....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert (16 Ga.)

	Cu Alloy	Cu Fe
Ashland,Ky.	A10.6.50	....
Canton,O.	R2 ..5.70	6.15
Fairfield	T2 ....5.70	....
Gary,Ind.	U5 ....5.70	5.95
Ind.Harbor	I-2 ..6.25	6.50
Irvin,Pa.	U5 ....5.70	....
Kokomo,Ind.	C16.5.80	....
MartinsFry.,O.	W10 6.25	....
Newport,Ky.	N9..5.70	5.95
Pitts.,Calif.	C11..6.45	....
SparrowsPt.	B2..5.70	....

SHEETS, Culvert Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ..6.50

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45†
Canton,O. R2 .....5.45‡
Delphos,O. N16 .....6.10‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 .....5.45†
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45†
Irvin,Pa. U5 .....5.45†
Kokomo,Ind. C16 ....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45†
Newport,Ky. N9 .....5.45†
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ...6.20‡
SparrowsPt., Md. B2 ..5.45‡
Steubenville,O. W10 ...5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 ....5.95†
Newport,Ky. N9 .....5.85
Niles,O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O., A10 ....6.25

SHEETS, Wall Casing

Fontana,Calif. K1 ....6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft.Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn.(10)S15	4.05
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.20
Ecorse,Mich. G5	4.20
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Houston,Tex. S5	4.45
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(25) B2	4.05
KansasCity,Mo.(9) S5	4.65
Lackaw'na,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
NewBritain(10) S15	4.05
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15	6.45
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Houston,Tex. S5	7.10
Ind.Harbor,Ind. Y1	6.70
KansasCity,Mo. S5	7.30
LosAngeles B3	7.90
NewBritn.,Conn.(10)S15	6.45
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Bridgeport,Conn.(10)S15	5.75
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.90
Detroit D2, M1, P20	5.90
Dover,O. G6	5.75
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. Y1	5.75
Ind.Harbor,Ind. I-2	5.85
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Mattapan,Mass. T6	6.30
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Mattapan,Mass. T6	12.80
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.75
Dover,O. G6	8.60
Ecorse,Mich. G5	8.75

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan, Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
New York W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	...	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‖ Coils. ¾-cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
Fairless,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	6.15
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	6.35
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7	9.35
Monessen,Pa. P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen, Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	8.05
FranklinPark,Ill. T6	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425‡
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.30 7.70†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.50 7.90†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40‡
Worcester A7	7.20 ....

*Based on 11c zinc; †5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga. Col.

Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149‡
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	154†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

†Based on 5c zinc; *11c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

AlabamaCity,Ala R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn.A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	163
KansasCity,Mo. S5	167
Kokomo,Ind C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed Col.

AlabamaCity,Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill. (1) N15	162

† Based on 5c zinc; *11c zinc; ‡10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'ld Galv. Stone	Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70*
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

* Based on 11c zinc; † 5c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill. (1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
¾" and smaller	55
⅞" to 1⅛", inclusive	58
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS
(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish	*43*
Plated finishes	*23*

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼ in. through ⅝-in.	38
¾-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
¾-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.
Structural ½-in., larger 9.25
7/16-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2¼	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
Huntington,W.Va. W7	...	...	...	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa, Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle,Wash. B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns—83.00-148.00	
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	29.75-37.25†
Bronze, 5000-lb lots	48.75-52.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	45.50‡
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ½-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 2 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cuts lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	...	....	...
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	...	....	...
Sharon, Pa. M6	13.25	16.25	33.75	16.75	34.25	17	34.25	17	....	...	....	...
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.75	21.00	....	34.75	30.25	35.75	....	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	....	....	....
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	....	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.25	37.50	47.75	55.75	54.50	56.75	60.00	64.00	64.00
316L	....	....	52.75	60.75	59.50	61.75	65.00	69.00	69.00
317	34.25	44.75	58.50	68.00	68.75	69.50	72.00	78.25	78.25
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
347	35.50	46.75	54.75	62.50	63.00	64.25	69.25	77.50	77.50
18-SCbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.00–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold-Rolled, 10%	Strip, Carbon Base, Cold-Rolled, Both Sides	Strip, Carbon Base, Hot-Rolled, 10%	Strip, Carbon Base, Hot-Rolled, Both Sides
Copper*	28.85	35.85	25.00	32.25

* Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	57.50
Buffalo H1	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
MuskegonMich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
NevilleIsland,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.
Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.
Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.
Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb pigiets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

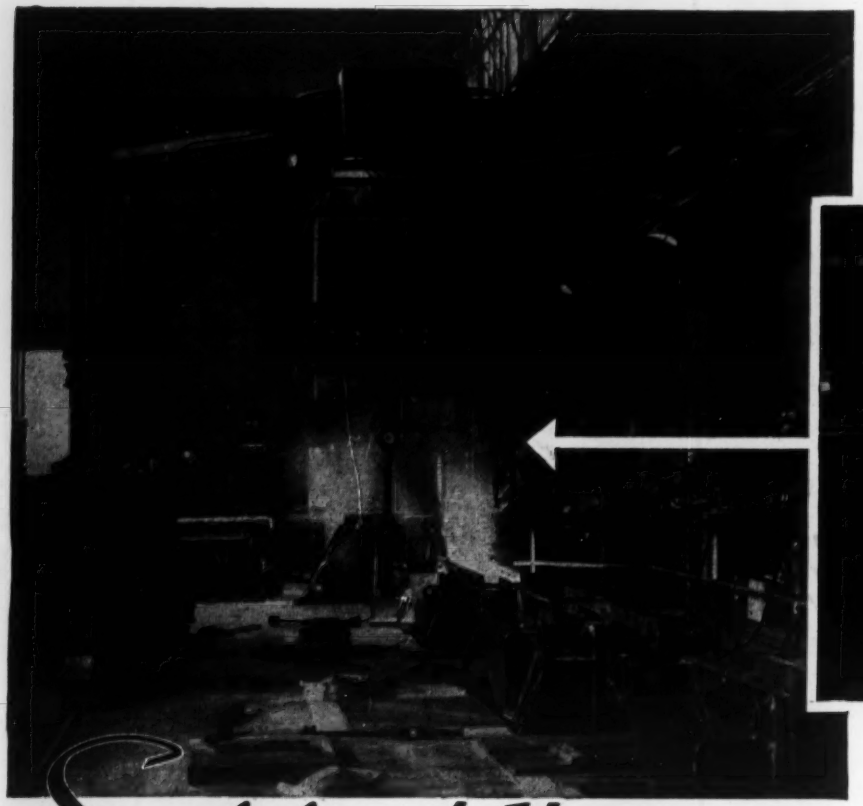
Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52[6]	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[2]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.20	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[6]	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[9]	6.96	8.80	6.74	8.36[6]	12.10	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.35	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	...	6.77	...	6 71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **½-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999; [2]—500 to 9999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 lb to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.



Left — This welding gantry in a prominent steel mill is the first application of the new Cleveland Tramrail stabilized hoist principle for welding purposes.

Below — The welding heads supported by the stabilized hoist, travel without sway or vibration and automatically apply a straight continuous and accurate welding bead.

Stabilized Hoist PROVIDES ~

VIBRATION-FREE TRAVEL FOR UNION MELT WELDING

The first application of a Cleveland Tramrail stabilized hoist for automatic welding by the Union Melt Process has proven completely successful. The stabilized hoist eliminates all vibration and pendulum motion at the welding heads, permitting the laying of straight, perfect welds.

The two welding heads are secured to the load bar of the hoist. The hoist in turn is supported by the Cleveland Tramrail gantry crane. The stabilized hoist which remains absolutely rigid in any position because of the unique triangular hoisting rope arrangement, can be adjusted to any height within 4'0" limits. Welds can be made of any length up to the length of the crane runway.

Welding speed may be varied from 4 to 80 inches per minute by changing the gantry travel speed by means of push buttons on the pendant control cable. A tachometer on the cable just above the buttons keeps the operator informed of the welding speed.

The gantry crane with stabilized hoist is lighter and easier to manipulate than the usual heavy structural type of welding travel equipment. It is simple to adjust, convenient to use and very flexible in application to different kinds of work.

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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

Republic Steel Corp.

Small but steady fourth-quarter gain sets the pace as . . .

Fastener Sales Join Upward Trend

FURTHER EVIDENCE of good times ahead is supplied by the fastener industry. Fasteners are a key link in the chain of fabrication, and their sales, which are definitely uptrending, are a good gage of general business activity.

The prevailing optimism in the fastener industry is traced to a rash of "urgent" orders. Not only that, customers who asked for early 1955 delivery are upping original orders and getting into the rush act, too.

At least three conclusions can be drawn: 1. The upturn in business has come along faster and farther than many people thought it would. 2. Inventories are pretty well shaved (too close in some cases). 3. Some replenishment of stocks is under way as manufacturers get ready for stiffer competition in 1955.

Outlook—For fasteners in general, prospects add up to about a 10-to-15 per cent gain in 1955 over 1954, most producers think. Some see their own companies in the 25 per cent bracket.

Right now, the automotive industry is the big gun as far as buying is concerned. Appliances, radio and television are also strong. Perhaps even more significant as far as indicating the way general business will go is a noticeable, though small, increase in the ordering of all kinds of fasteners by all kinds of users. It bodes to become a sustained improvement, too, continuing after seasonally high automotive buying slacks off.

Babies, Tailoring — Reasons why his own company is optimistic are pointed out by L. H. Flora, director of sales for Tinnerman Products Inc., Cleveland: "1. The population is still growing. 2. There is an increasing demand for engineered fasteners to speed assembly."

In addition to tailoring fasteners to a customer's needs, fastener producers are also bringing out new products and finding new markets. Along this line, Republic Steel Corp. is doubling the sales force of its Bolt & Nut Division.

Vigorous Selling—"The acceptance of new Republic fasteners in the areas where they have been promoted indicates that far broader fields may be developed by vigorous selling. We intend to reach those fields with our expanded sales force," says Harvey A. Craig, manager of sales for the division. Better customer service is also an aim.

That service angle is important. Competition, always spirited in the industry, got even stiffer about last March. So, like many another industry, fastener people are girding for even more competitive days to come. Improved service, methods, products and equipment are all part of management planning.

Inventory—Again along the service angle, many producers are carrying larger than usual stocks. The reason is that many customers still are leery of inventory. They are depending on the fastener makers to be able to supply what they need when they want it.

Some manufacturers inadvertently find themselves in a position to do just that. Like other companies they got caught with high stocks; now they're drawing on that inventory to keep hand-to-mouth buyers fed.

Demands—On raw materials, fastener producers generally have lower inventories. But they're watching them carefully, making sure they're adequate. For example, E. D. Cowlin, general manager of Reliance Division, Eaton Mfg. Co., Massillon, O., says: "Our raw material position is better today than it was a year ago —it has to be to meet the demands of our customers."

For many kinds of fasteners, foreign competition isn't too much of a headache. But in some lines, domestic producers are feeling something heavier than a pinch. Wood screws are hardest hit, but some machine screws are getting squeezed. Most such competition is strictly on a price basis and is most noticed on the East, West and Gulf coasts. Great Lakes ports are avenues for some foreign goods now, and as the St. Lawrence is opened up, more imports are expected via those routes.

Imported Steel Prices Rise

Prices on steel imported from Europe are advancing sharply, and they're expected to get still higher before year end. This reflects active demand on the other side and sharply extended delivery promises. European promises on deformed and merchant bars for shipment here range four to five months; also on bar-size angles, especially the smaller sizes. Promises on cold-rolled sheets and wire rods range five to seven months. Delivery promises on structural angles and I-beams are less extended, ranging from two to three months.

Actually, European countries are beginning to turn to this country for such tonnage as heavy bars for forgings, cold sheets, slabs and sheet bars. There is a still stronger demand for tin plate. No little steel inquiry is coming from countries which no longer can obtain even reasonable promises from European sources of supply.

Adding to the strength of European steel prices here is the prospect that ocean rates will be advanced anywhere from $1 to $1.25 a ton, effective Feb. 1.

European products to have been advanced here are deformed bars, bar size angles, structural angles, I-beams, merchant bars, hot rolled bands and wire rods. New prices are indicated in the accompanying table.

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$5.30	$5.30	$5.30	$5.58
Bar Size Angles	5.10	5.10	5.10	5.38
Structural Angles	4.65	4.65	4.65	4.93
I-Beams	4.65	4.65	4.65	4.93
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.50	5.78
Furring Channels, C.R., 1000 ft, ⅝ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	5.10	5.10	5.10	5.38
Hot-Rolled Bands	5.50	5.50	5.50	5.78
Wire Rods, Thomas Commercial No. 6	5.30	5.30	5.30	5.58
Wire Rods, O-H Cold Heading Quality No. 5	5.75	5.75	5.75	6.03
Bright Common Wire Nails	6.85	6.95	6.90	7.15

*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb. net, reel.

Sizes O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

November Steel Output Rises

Highest monthly production of steel in a year was achieved in November, with output totaling 8,074,000 net tons, reports the American Iron & Steel Institute. Output was 372,467 tons greater than in October (7,701,533 tons), but it was substantially under the production of 8,690,052 tons in November, 1953.

Production during November was 78.9 per cent of this year's capacity and compares with 72.9 per cent in October. The production index in the month rose to 117.3, highest for any month since November of last year, compared with 108.3 in October.

During the first 11 months of this year, output totaled 80,009,152 net tons. This compares with 103,663,391 tons in the like period of 1953. The 11-month total was 4.4 per cent above the average output of 1947-49.

Stainless Steel . . .

Stainless Steel Prices, Page 120

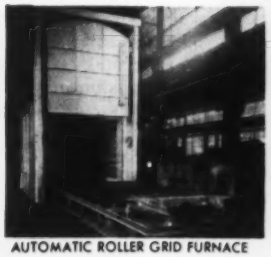
An upward revision in prices of nickel bearing stainless steels and certain grades of nickel alloy steels was efected Dec. 11 by U. S. Steel Corp. The increases in stainless prices vary by grade in relation to nickel

Period	OPEN HEARTH Net tons	OPEN HEARTH Per cent of capacity	OPEN HEARTH ‡Index	BESSEMER Net tons	BESSEMER Per cent of capacity	BESSEMER ‡Index	ELECTRIC Net tons	ELECTRIC Per cent of capacity	ELECTRIC ‡Index	TOTAL Net tons	TOTAL Per cent of capacity	TOTAL ‡Index	Calculated weekly production (Net tons)	Number of weeks in month
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Qtr.	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,950	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,728	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
2nd Qtr.	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.6	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.42
Aug.	6,021,496	65.0	94.0	217,837	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
Sept.	6,140,266	68.6	99.1	214,065	54.5	63.0	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Qtr.	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.1	20,101,987	64.2	95.2	1,530,997	13.13
9 Mo.	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,015	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
*Oct.	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,495	4.43
†Nov.	7,291,000	81.2	117.6	231,000	58.6	67.9	552,000	64.2	159.7	8,074,000	78.9	117.3	1,882,000	4.29
1953														
January	8,841,679	101.4	138.0	350,200	88.9	99.7	706,083	81.2	197.7	9,897,962	99.1	139.1	2,234,303	4.43
February	7,939,299	100.8	137.2	329,389	92.6	103.8	664,091	84.6	205.9	8,932,779	99.1	139.0	2,233,195	4.00
March	9,050,773	103.7	141.3	354,710	90.0	101.0	762,615	87.7	213.5	10,168,098	101.8	142.9	2,295,282	4.43
1st Qtr.	25,831,751	102.0	138.9	1,034,299	90.4	101.4	2,132,789	84.5	205.7	28,998,839	100.0	140.4	2,254,964	12.86
April	8,493,909	100.5	137.0	334,605	87.7	98.4	717,024	85.2	207.4	9,545,538	98.7	138.7	2,225,067	4.29
May	8,925,163	102.3	139.3	354,577	90.0	100.9	717,340	82.5	200.8	9,997,080	100.1	140.5	2,256,677	4.43
June	8,394,502	99.4	135.4	332,060	87.0	97.7	677,917	80.5	196.1	9,404,479	97.2	136.6	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	137.3	1,021,242	88.3	99.0	2,112,281	82.7	201.5	28,947,097	98.7	138.6	2,224,988	13.01
1st Half	51,645,325	101.4	138.1	2,055,541	89.3	100.2	4,245,070	83.6	203.6	57,945,936	99.4	139.5	2,239,889	25.87
July	8,316,342	95.5	129.8	324,068	82.4	92.2	635,263	73.2	177.9	9,275,673	93.1	130.4	2,098,569	4.42
Aug.	8,463,155	97.0	132.1	310,074	78.7	88.2	632,351	72.7	177.0	9,405,580	94.2	132.2	2,123,156	4.43
Sept.	8,076,277	95.8	130.3	287,638	75.6	84.6	519,513	61.9	150.3	8,883,428	92.1	129.0	2,075,567	4.28
3rd Qtr.	24,855,774	96.1	130.8	921,780	78.9	88.4	1,787,127	69.4	168.6	27,564,681	93.1	130.6	2,099,366	13.13
9 Mos.	76,501,099	99.6	135.6	2,977,321	85.8	96.2	6,032,197	78.8	191.8	85,510,617	97.3	136.5	2,192,550	39.00
Oct.	8,648,428	99.1	135.0	325,250	82.6	92.6	489,044	56.3	136.9	9,462,722	94.7	133.0	2,136,055	4.43
Nov.	8,002,349	94.7	129.1	283,321	74.3	83.3	404,382	48.0	117.0	8,690,052	89.9	126.2	2,025,653	4.29

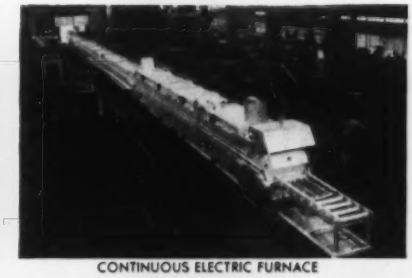
Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,949 net tons; based on annual capacities as of Jan. 1, 1954 as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1953 of 1,969,275 net tons open hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953 as follows: Open hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons.

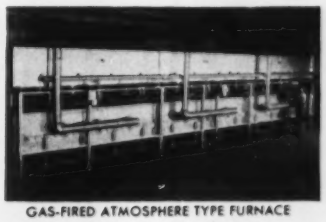
*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.



AUTOMATIC ROLLER GRID FURNACE



CONTINUOUS ELECTRIC FURNACE

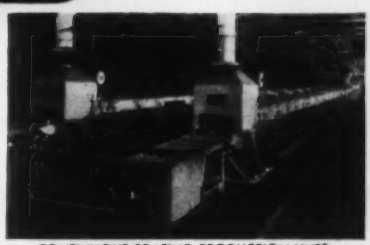


GAS-FIRED ATMOSPHERE TYPE FURNACE

BIG ONES

AUTOMATIC ROTARY HEARTH FURNACE

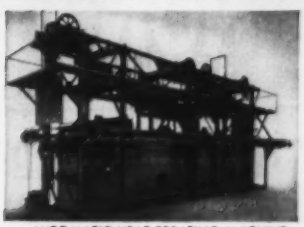
ALUMINUM BILLET HEATER



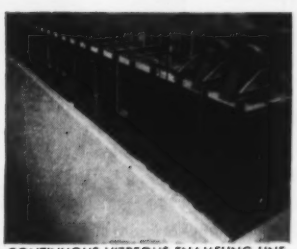
CONTINUOUS BRAZING PRODUCTION LINES

CONTINUOUS ROTARY RETORT FURNACE

CONTINUOUS CONVEYOR FURNACE



AUTOMATIC HEAT TREATING MACHINE



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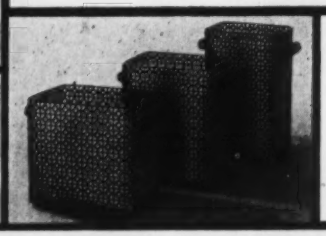
Ideal design for the Ideal Mfg. Co.



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With today's trend toward modern styling, Hendrick is becoming more and more important to fabricators of metal products. Typical of these is the Ideal Mfg. Co. of Oskaloosa, Iowa, who manufactures the attractive home furnishing items shown above using Hendrick's Perforated Metal Square Link design.

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content. The over-all effect is an average increase of less than 2 per cent. The increases in alloy steels also vary according to nickel content, the average amounting to less than 1 per cent. The new prices result from the recent advance in the price of primary nickel.

Wire . . .

Wire Prices, Pages 118 & 119

Merchant wire demand is slow, with the holidays keynoting the seasonal downtrend. Business in manufacturers wire is featured by fair buying for screw machine products and automobile seat springs.

In New England the increase in wire orders is heaviest with mills producing high carbon grades for automotive consumption. Buying of other industrial grades, while improved, is less pressing as regards shipments.

Automakers and their suppliers are giving a shot in the arm to manufacturers wire sales at Pittsburgh.

Steel Bars . . .

Bar Prices, Page 116

Domestic sellers of carbon steel bars report improved demand from warehouses which over recent months have been relying on foreign sources of supply, particularly in the East.

Foreign prices are higher than they were, and deliveries from abroad have become much more extended.

There also has been some pickup in demand, generally, though volume leaves much to be desired. The gain has been mostly in small sizes, both carbon and alloy.

Price increase on nickel-bearing alloy bars had been expected, but few users placed stock orders to beat the advance.

Somewhat better operations of farm equipment manufacturers are being reflected moderately in Chicago-area demand.

Plates . . .

Plate Prices, Page 116

Plate producers are slightly encouraged over prospects for business after the holidays. Compared with pre-holiday volume, they look for a mild improvement in demand.

Most mills are confident the first quarter will show definite gain over the three months now ending. They anticipate more ship tonnage and possibly a little better railroad demand; also freer boiler requirements from the utilities and continued good demand from the chemical industry.

Bethlehem Steel Co. has received the formal contract for the con-

struction of two 20,500-gross ton tankers from the Cities Service Oil Co. at Sparrows Point, Md.

U. S. Steel Corp. has licensed Lukens Steel Co., Coatesville, Pa., to manufacture "T-1" constructional alloy steel. This is a new and patented material developed to meet the need for a steel to be used mostly in plate form—it must have high yield strength, be tough enough to withstand unusual stresses and pressures at both high and low temperatures and be easy to weld. Its yield strength of 90,000 lb per sq in. is three times that of ordinary carbon steel.

Warehouse . . .

Warehouse Prices, Page 121

Higher mill prices on stainless steel (an increase of 50 cents per 100 lb in type-302 sheets, for instance) are being reflected in the warehouse market. Distributors have raised their quotation on 302 stainless sheets from 45.55c to 46c a pound in Chicago and sellers in other districts are preparing new schedules.

Prices on most products are $2 a ton higher in the Los Angeles district. The price situation otherwise is unchanged, except that distributors note less competition from foreign steel. Quotations on the latter generally are higher than they were, and deliveries are more extended.

Structural Shapes . . .

Structural Shape Prices, Page 116

Despite holiday influences, structural steel demand is still fairly brisk, especially for bridges, schools and other types of public work in the East. Fabricated steel prices, however, continue weak.

In the Pacific Northwest, construction involving schools, churches and small industrial plants is actively calling for a fair volume of structurals in small tonnages.

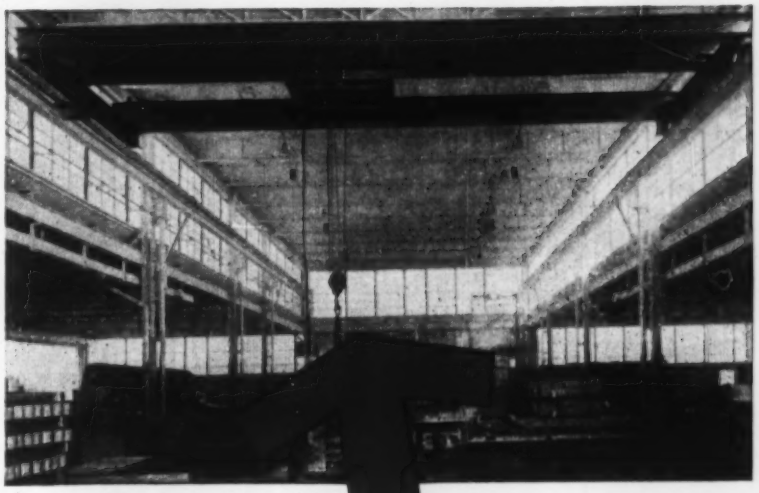
Fabricators report backlogs are down, but the outlook is considered favorable.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 117 & 118

Sheet deliveries are becoming more extended. Except for an occasional spot opening, delivery promises on cold-rolled range up to nine weeks, even beyond in some cases. Producers are scrutinizing inquiries more closely, and while quotas have not been set up, at least one producer in the East is closer to allocating than he has been for a long time.

Promises on continuous hot-dipped galvanized sheets remain the most



Our cranes [illegible]eak down!

Let's not kid ourselves. Poor maintenance, operator abuse, and just plain wearing out will put any industrial machinery out of commission.

Happily, this inevitable "down time" can be limited to hours on Michigan Cranes instead of the customary days or weeks. We use standard gears, bearings, and other expendable parts that can be purchased locally without the weeks of waiting that are often required when these parts are "custom".

Michigan is not however an "assembly shop" that throws together a lot of parts to make a crane. We just believe in using the engineering talents of many large companies and incorporating their components in our cranes when they meet our standards.

And you'll find these parts are much cheaper when replacement comes around. Those parts we make are carried in stock and can be shipped in a hurry.

For further information, write for bulletin 154 to Michigan Crane & Conveyor Corp., 114 North McKinstry Ave., Detroit 9, Michigan.

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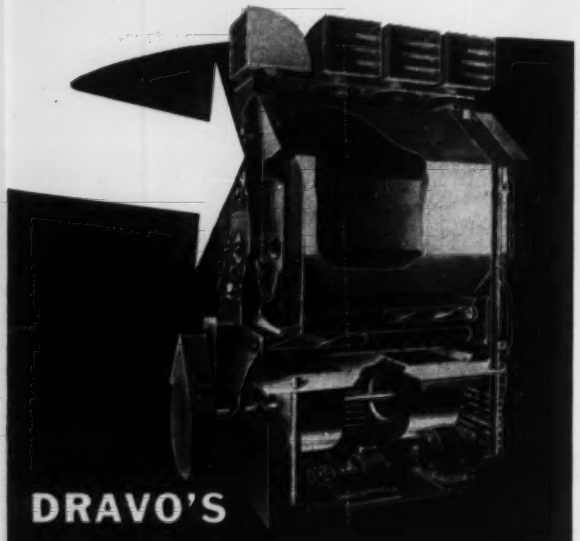

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- ☐ *Gas Fired* Unit Heater 88,000 to 160,000 Btu/hr. output
- ☐ Please have a representative call at no obligation to me. Ask for Bulletin JK 598-910

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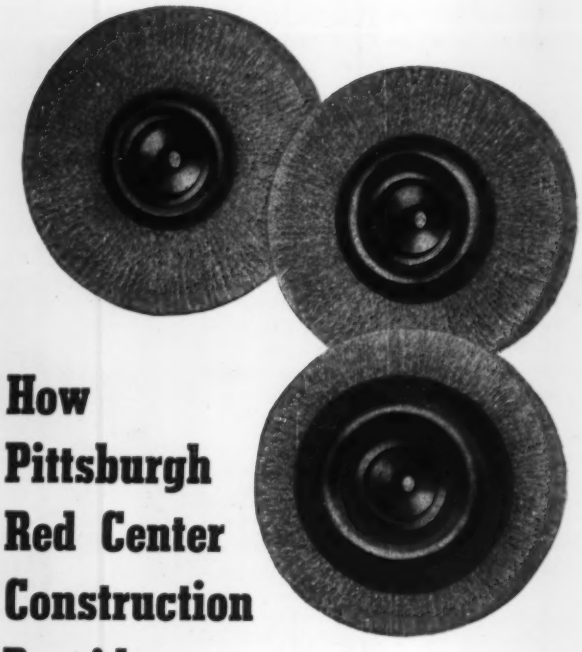

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Faster cutting while maintaining smooth finish • Freedom from shedding • Perfect balance • Longer life

In conventional brushes, when faster cutting action is desired, coarser wire is used. But increasing the wire gauge causes brittleness, destroying the wearing quality of the brush, and resulting in excessive scoring of the work.

Pittsburgh has solved this problem by maintaining the same ideal gauge wire in every brush, but increasing the fill and diameter of the hub and center plate of brushes designed for faster cutting. Thus, although cutting speed is increased, work remains unscored and the wire does not lose its inherent power to flex. These Red Center brushes last longer, maintain perfect balance throughout life, and do a better job all around.

This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write for free Catalog #54-W. Address: PITTSBURGH PLATE GLASS CO., *Brush Div.*, Dept. O12, 3221 Frederick Ave., Baltimore 29, Maryland.

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extended of all flat-rolled products. Most producers no longer are quoting for the first quarter, actually being sold out well beyond that period. Certain sellers claim they are out of the market for the entire first half of next year. Noncontinuous hot-dipped galvanized sheets, however, can still be purchased for early February shipment.

Demand for enameling stock has picked up appreciably for refrigerators and washing machines.

Tubular Goods . . .

Tubular Goods Prices, Page 120

The cutback in oil country goods purchasing will probably be limited to this month. Declines in December sales are traced to year-end inventory reductions, with an accompanying slackening in forward ordering.

New January orders for seamless tubes for oil country use are being received. Sales managers think 1955's total requirements will at least equal 1954's.

Pig Iron . . .

Pig Iron Prices, Page 121

With some foundries closing down for a week following the Chrismas holiday, pig iron shipments this month will drop from the November level, the 1954 peak for some sellers.

Producers anticipate a quick rebound from the holiday lull, but foresee little improvement in January over the October-November business volume.

Ferroalloys . . .

Ferroalloy Prices, Page 131

The price of Molybdic oxide has been raised 10 per cent by Climax Molybdenum Co., New York. Prices of other refined products were increased proportionately. This is the first increase on these items in four years. Molybdic oxide is now $1.25 per pound of contained molybdenum; molybdic oxide briquettes, $1.27; ferromolybdenum, $1.46; molybdenite concentrate, $1.05.

New quantity extras for molybdenum products (dollars per lb Mo) applied on the weight of each on a given order shipped at one time, follow:

5000 lb or more	base
1000 up to 5000 lb	0.02
500 up to 1000 lb	0.03
100 up to 500 lb	0.06
25 up to 100 lb	0.06, plus $5 packing

The extras are applicable to all products except moly-sulfide and are subject to change without notice.

Reduction of $4 per net ton in the carload bulk price (effective Jan. 1) of all briquetted alloys has been

(*Please turn to page* 138)

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$25.00-$26.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic
(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of 8lb content, c.i.f. seaboard

50-60%	$3.35-$3.85
60-65%	4.00-4.35

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haideman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$46
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5⅛	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18, 20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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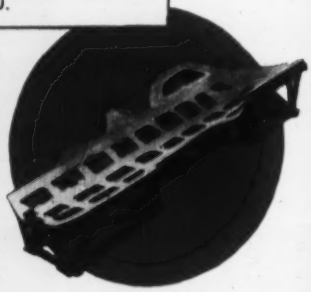

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.05c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.05c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ⅝ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.27 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200 lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo., f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

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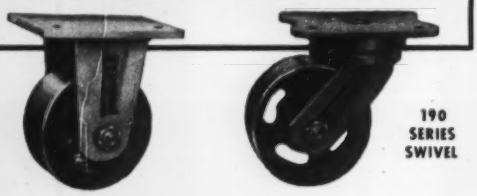

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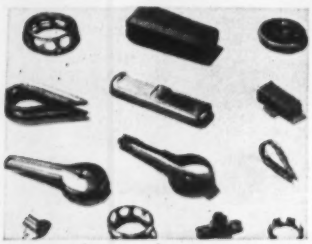

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Scrap . . .

Scrap Prices, Page 134

Philadelphia—Open hearth grades of scrap are slightly easier, with No. 1 heavy melting steel and No. 1 bundles holding at $31.50 to $32, delivered; No. 2 heavy melting at $29; and No. 2 bundles at $26 to $26.50. Other steel grades are unchanged, although prices on No. 1 busheling and electric furnace bundles are nominal. No. 1 cupola cast is lower at $24 to $25, delivered.

New York—Increased buying by some of the larger consumers and the higher price of nickel have resulted in higher offerings by brokers for stainless steel scrap. The market on 18-8 sheets, clips and solids now is $175 to $180, on 18-8 borings and turnings $75 to $80, on No. 430 sheets, clips and solids $55 to $60, the 410 grade $45.

Boston — For export, No. 2 heavy melting steel is off $1 per ton and other grades are inclined to be soft. Domestic prices also are easy, predicated on lack of buying. For No. 1 steel $25 to $26, dock, is paid, depending on freight. This is nearly $3 down from the former high dock prices.

Washington—Consumption of ferrous scrap during October totaled 4,786,000 gross tons, reports the Bureau of Mines. This was an increase of 12 per cent over the September tonnage, setting a new monthly high for the year.

Stocks of scrap held by consumers totaled 5,802,000, a slight decrease from September figures. The 2,343,000 tons of pig iron held by users and suppliers decreased 4 per cent from September.

Buffalo—The scrap market here is holding steady, with dealers busily shipping against outstanding orders. New bidding is light, but dealers are hoping that 100 per cent steel operations will lead to higher prices in the near future. Mills admit that the large reserve will deplete rapidly if the current ingot rate is sustained. Canadian buying continues to support the local cast iron market.

Pittsburgh—No major orders or price changes are expected the balance of this year. Scrap dealers continue to fill orders placed early this month by leading steelmakers.

Cincinnati — Purchases of No. 1 heavy melting steel by one mill pushed the price up $1 a ton to $31-32.

Seattle—The scrap market is unchanged. Receipts and consumption are balanced. Prices continue firm. Larger interests hold ample inventories and not much turnover is expected until next month. Cast iron is in much the same situation as steel scrap. Receipts are sufficient to meet demands. No winter shortage is anticipated.

Detroit — Scrap continues to pour from auto plants at a high rate. Market observers note a softer tone, though prices have not actually dropped.

Chicago — Scrap buying continues in the doldrums, with prices holding steady and new buying conspicuously absent. The likelihood of important sales over the remainder of this year seems remote.

Los Angeles—Some mills are buying scrap direct and trucking it from remote areas. This increasing practice reduces the flow of steelmaking scrap to dealers in many instances.

San Francisco—Weakness is noted in cast scrap prices. Foundry inventories are good. Supplies are reported gaining.

Lithium Price Reduced

Foote Mineral Co., Philadelphia, last week announced reduction in the price of lithium hydroxide monohydrate. Reductions, covering all price brackets, average 15 per cent and reflect economies resulting from expanded production.

Iron Ore . . .

Iron Ore Prices, Page 129

Lake shipments of iron ore in the 1954 shipping season, just ended, totaled 60,793,697 gross tons, reports the Lake Superior Iron Ore Association. This was a decline of 35,050,752 tons (36.57 per cent) from the 95,844,449 tons shipped in the 1953 navigation season.

Total shipments this year were the smallest since 1946 when only 59,356,716 tons moved down the lakes,

(*Please turn to page* 136)

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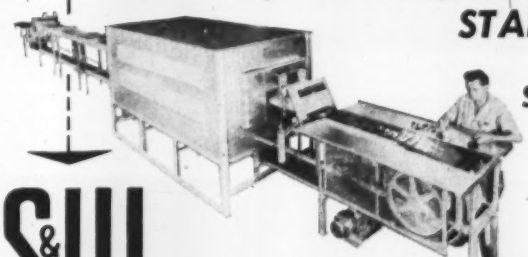

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Dec. 15	$32.42
Dec. 8	32.58
Nov. Avg.	33.29
Dec. 1953	39.69
Dec. 1949	28.03

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting..	32.00-33.00
No. 2 heavy melting..	28.00-29.00
No. 2 bundles	26.00-27.00
No. 1 bundles	32.00-33.00
No. 1 busheling	32.00-33.00
Machine shop turnings	12.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings.	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 5 ft lengths	35.00-36.00
Heavy turnings	29.00-30.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	31.00-32.00
Heavy breakable cast.	30.00-31.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast..	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 2-ft and under.	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	40.00-41.00
Railroad specialties	37.50-38.50

Stainless Steel Scrap

18-8 bundles & solids	185.00-195.00
18-8 turnings	90.00-95.00
430 bundles & solids..	75.00-80.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	32.00-33.00
No. 2 heavy melting..	28.00-29.00
No. 1 bundles	32.00-33.00
No. 2 bundles	24.00-25.00
No. 1 busheling	32.00-33.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings..	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	34.00-35.00
Cut structural plate 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Stove plate	38.00-39.00
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	30.00-31.00
Brake shoes	31.00-32.00
Clean auto cast	44.00-45.00
No. 1 wheels	37.00-38.00
Burnt cast	29.00-30.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	44.00-45.00
Rails, 3-ft and under.	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths.	43.00-44.00
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	42.00-43.00
Rails, rerolling	52.00-53.00

Stainless Steel (Brokers' Buying Prices)

18-8 bundles, solids	175.00-180.00
18-8 turnings	70.00-80.00
430 clips, bundles, solids	70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	29.00-30.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
Machine shop turnings	14.00-15.00
Short shovel turnings..	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	36.00-37.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting..	32.00-34.00
No. 2 heavy melting..	30.00-31.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles..	32.00-33.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-34.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings.	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3-ft..	36.00-37.00
Punchings & plate scrap	36.00-37.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	32.00-33.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	42.00-43.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	42.00-44.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	43.00-44.00
Rails, rerolling	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	175.00-180.00
18-8 turnings	75.00-80.00
430 bundles & solids..	65.00-70.00
430 turnings	30.00-40.00

Chicago Mercantile Exchange

(Week ended Dec. 15)

No. 1 Heavy Melting

	High	Low	Close
Jan.	34.625	34.25	35.00†
Mar.	36.00	36.00	36.00*

No. 2 Heavy Melting

Feb.	33.625	33.125	33.125

Sales (40-ton Units): 16 January; 3 February; 2 March. *Nominal. †Bid.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	27.00
No. 2 heavy melting...	19.00
No. 1 bundles	27.00
No. 2 bundles	18.00
No. 1 busheling	26.00
Machine shop turnings	11.00
Mixed borings, turnings	11.00
Short shovel turnings ..	14.00
Punching & plate scrap	28.50

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting..	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	20.00-21.00
No. 1 busheling	30.00-31.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings..	17.00-18.00
Cast iron borings	17.00-18.00
Low phos. 18-in.	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast..	35.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths.	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*31.50-32.00*
No. 2 heavy melting	*29.00*
No. 1 bundles	*31.50-32.00*
No. 2 bundles	*26.00-26.50*
No. 1 busheling	*30.00-30.50**
Electric furnace bundles	*33.50**
Machine shop turnings.	18.00
Mixed borings, turnings	19.00-19.50
Short shovel turnings ..	21.00-21.50
Structurals & plate ..	34.50-35.00
Heavy turnings	29.50-30.00
Couplers, springs, wheels	35.00
Rail crops, 2 ft & under	46.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	41.50-43.00
Heavy breakable cast..	36.00-36.50
Drop broken machinery	42.00-43.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	26.00-27.00
No. 2 heavy melting...	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	20.00-21.00
Machine shop turnings.	9.10-10.00
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	29.00-30.00
Short shovel turnings ..	12.00-13.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	*175.00-180.00*
18-8 borings, turnings	*75.00-80.00*
430 sheets, clips, solids	*55.00-60.00*
410 sheets, clips, solids	*45.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	22.00-23.00
No. 2 heavy melting..	16.00-16.50
No. 1 bundles	*23.00-24.00*
No. 2 bundles	*14.50-15.00*
Mixed borings, turnings	*9.50-10.00*
Machine shop turnings	7.50-8.00
Short shovel turnings	*10.50-11.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

BUFFALO

No. 1 heavy melting..	30.00-31.00
No. 2 heavy melting..	27.50-28.50
No. 1 bundles	30.00-31.00
No. 2 bundles	25.50-26.50
No. 1 busheling	30.00-31.00
Machine shop turnings	18.00-19.00
Mixed boring, turnings	20.00-21.00
Short shovel turnings.	21.00-22.00
Cast iron borings	20.00-21.00
Low phos.	33.00-34.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under.	42.00-43.00
Railroad specialties ..	36.50-37.50

BIRMINGHAM

No. 1 heavy melting..	26.00-27.00
No. 2 heavy melting..	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings.	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate..	33.00-34.00
Structural plate, 2 ft ..	33.00-34.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	30.00
No. 2 heavy melting..	28.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shop turnings	13.00
Short shovel turnings.	15.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast .	32.50
Unstripped motor blocks	32.50
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	35.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00
Rails, 18-in. and under	46.00
Rails, random lengths.	43.00-45.00
Rail, rerolling	51.00
Angles, splice bars	40.00-41.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting..	27.00
No. 2 heavy melting..	23.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings..	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast..	23.00
Unstripped motor blocks	25.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths..	30.00-34.00

LOS ANGELES

No. 1 heavy melting..	20.00
No. 2 heavy melting..	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings.	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting..	24.00
No. 2 heavy melting..	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings.	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	*43.00*
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting..	26.00
No. 2 heavy melting..	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	12.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

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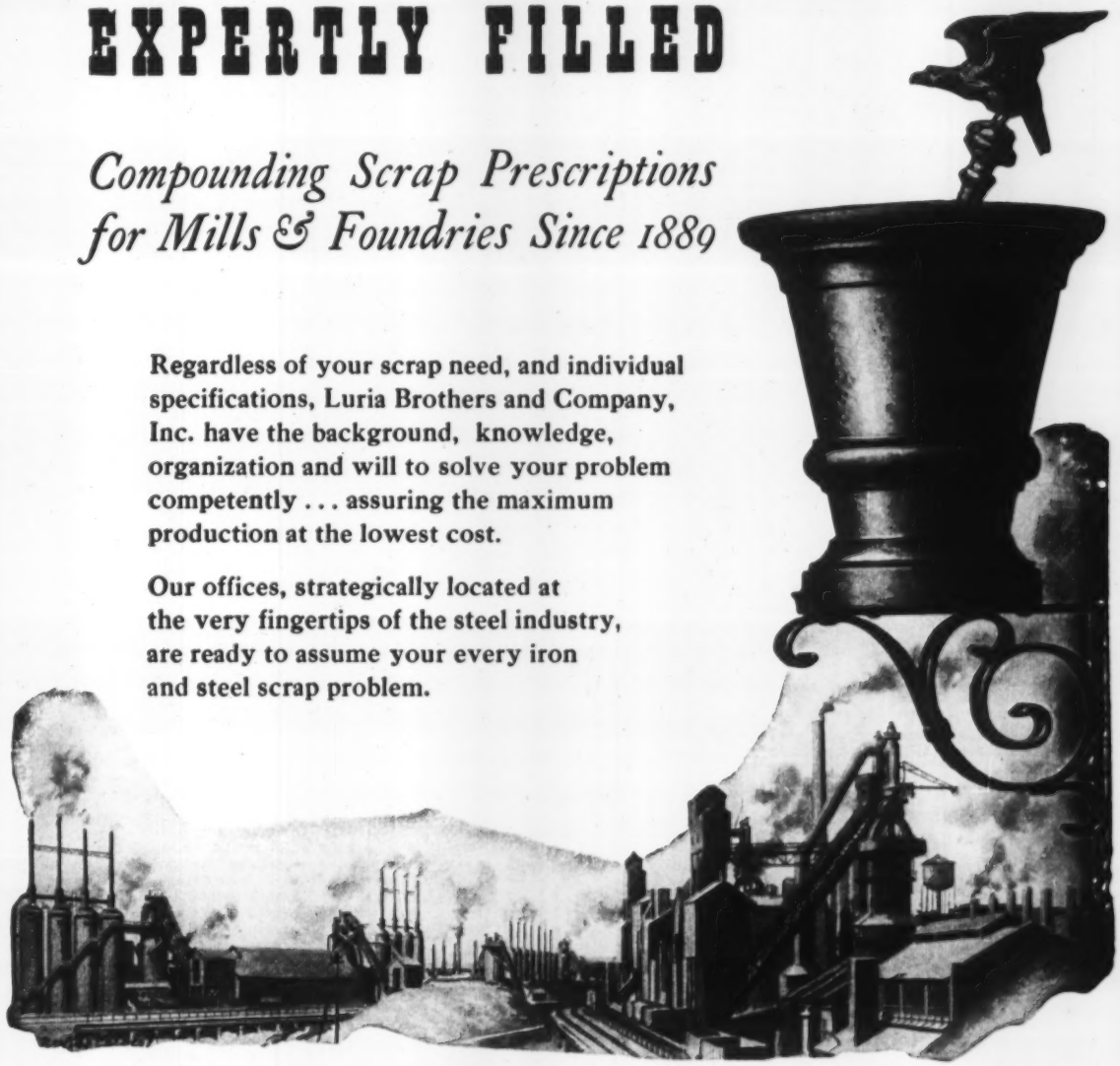

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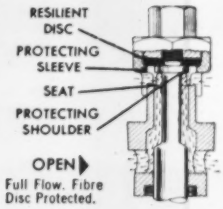

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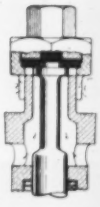

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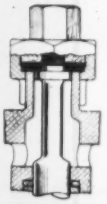

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It will pay you to get the facts about HOMESTEAD Protected-Seat HYDRAULIC OPERATING VALVES—the valves that give you quick, finger-tip control for moving or positioning any single-acting or double-acting hydraulic piston. The exclusive Homestead Protected-Seat reduces fluid velocity during the closing operation to practically zero. Thus seat erosion and resultant leakage, the most frequent cause of shut-downs and lost production time, is eliminated. Records of 6 to 18 months continuous service without maintenance are common.

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HOMESTEAD VALVE MANUFACTURING COMPANY
Serving since 1892

P. O. BOX 22 CORAOPOLIS, PA.

(*Concluded from page* 133)

with shipments that year being curtailed by a strike.

Movement in December totaled 17,644 tons, all through Escanaba, Mich. Last year there were no shipments recorded in December.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 129

Production of coke in October totaled 5,083,271 net tons, reports the Bureau of Mines. This was 13 per cent above September output but was nearly 1.5 million tons below the quantity produced in October 1953.

Consumption showed improvement. Stocks on hand at producing plants at end of October amounted to 17.5 days' ouput, compared with almost 20 days in September.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3700 tons, state bridge, Berks county, Pa., reported placed through J. Richard Nissley, general contractor, with Delaware Steel Fabricating Corp., Wilmington, Del.

2500 tons, viaduct, contract 2, Northeast expressway, Chelsea, Mass., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Coleman Bros. Corp., Boston, general contractor.

1365 tons, bridge, Croaton Sound, Dare county, North Carolina, to American Bridge Division, U. S. Steel Corp., Pittsburgh; T. A. Loving Co., Inc., Goldsboro, N. C., general contractor.

735 tons, Groveton high school, Fairfax, Va., to Southern Iron Works, Inc., Chamblee, Ga.; Eugene Simpson & Bros., Alexandria, Va., general contractors.

700 tons, high school, West Springfield, Mass., to Haarmann Steel Co., Holyoke, Mass.; Tornabene Bros., Newton, Mass., general contractors.

550 tons, two bridges, Seattle's Gorge dam expansion, to American Bridge Division, U. S. Steel Corp., Portland, Oreg.

530 tons, public school No. 197, Manhattan, New York, to Lehigh Structural Steel Co., Allentown, Pa.

530 tons, public school No. 19, Manhattan, New York, to Lehigh Structural Steel Co., Allentown, Pa.

STRUCTURAL STEEL PENDING

4700 tons, subway alterations, DeKalk Ave., Brooklyn, N. Y., for the Board of Transportation, Poirier & McLane Corp., low on general contract.

3617 tons, state bridge work, schedule 3, Beaver county, Pa., bids Jan. 7; schedule 2 calls for 3258 tons, and schedule 1, 359 tons; substantial tonnage of reinforcing bars also is required for this project.

3000 tons, superstructure, bridge, Providence river, Providence, R. I.; taking bids on piers and substructure.

2970 tons, 11 multipurpose hangars, Loring Airfield Base, Limestone, Me.; bids in to Corps of Engineers, Boston.

2430 tons, nine multipurpose hangars, Air Field Base, Portsmouth, N. H.; bids Jan. 7, Corps of Engineers, Boston.

1800 tons, William Grady Vocational School, Brooklyn, N. Y., Board of Education, bids closed Dec. 10.

1300 tons, Manhattan approaches to the new Lincoln tube, New York, Gull Contracting Co., Long Island City, N. Y., low on general contract.

1000 tons, maintenance hangar with shops and building additions, municipal airport, Youngstown, O.; bids Dec. 23, Corps of Engineers, Huntington, W. Va.

930 tons, paper warehouse, Star Corrugated Box Co., Brooklyn, N. Y., pending.

900 tons, stop logs, gates, guides, trash racks, etc., Seattle's Gorge dam expansion, general contract awarded.

900 tons, state bridge, Northeast turnpike ex-

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	Set Solid	All Capitals	All Caps Leaded
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Penton Building, Cleveland 13, Ohio

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Reply Box 184, STEEL
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For small long-established Forging Plant in Akron, Ohio. Prefer man who has a good knowledge of Small Upsetters (2" sizes), Drop Hammers (3000 lbs), Maxi Presses, Punch Press, Tool and dies, etc. Plant manufactures nationally known line of Mechanic Hand Tools.

If you have proven supervisory and management ability in directing a working force of approximately 50 people, write stating full particulars, salary expected, etc.

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Help Wanted

METALLURGICAL OR CHEMICAL ENGINEERING GRADUATE wanted to assist Melting Department metallurgist in steel mill making high speed, tool, stainless, specialty steels and high temperature alloys. Reply giving details of education, experience, age, references, etc. Box 177, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGICAL GRADUATE with several years' experience for process development in steel mill making high temperature alloys, high speed, tool, stainless and specialty steels. Duties would involve development of processing procedures for new alloys as well as the improvement of processes for established alloys under direction of Process Development Metallurgist. Reply giving details of education, experience, age, references, etc. Box 178, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGIST FOR LABORATORY WORK in steel mill making high temperature alloys, high speed, tool, stainless and specialty steels. Work will include metallurgical examination of materials, writing of reports, conducting investigations of mill problems involving a large variety of alloys. Good opportunity for graduate with 1 to 3 years' experience. Reply giving education, experience, age, references, etc. Box 179, STEEL, Penton Building, Cleveland 13, Ohio.

WANTED — VERY MUCH ALIVE — ONLY Two Tool, Carbon, Alloy, Stainless Steel Salesmen to represent established steel producer. Should have good working knowledge of specialty steel production and applications. Graduate metallurgists not required, but equivalent experience a requisite. One man to cover expanding Delaware Valley Area and one to cover National Territory on special assignments. State territory preference and salary desired. Reply Box 182, STEEL, Penton Building, Cleveland 13, Ohio.

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SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 45 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC., 665 Brisbane Bldg., Buffalo 3, N.Y.

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Any size, type and quantity
Get our cash offer by return mail
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Sliding gap Lathe 16" x 34" to 20" x 40" 6 foot center to center minimum. Must be heavy duty, late type. Give full particulars including make, price, location and condition, in first letter.
THE LANG COMPANY, INC.
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Salt Lake City, Utah

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Positions Wanted

PLANT AND PRODUCTION MANAGER, Engineering Graduate (M.I.T.) indoctrinated in practical operating experience. Proven record of accomplishment in efficient plant supervision, control, and cost reduction coupled with amicable labor relations. Reply Box 134, STEEL, Penton Building, Cleveland 13, Ohio.

EXPERIENCED FORGING ENGINEER AVAILABLE. Expert in hand tools and railroad work, production, design and management. Willing to travel. Passport in order. Reply Box 145, STEEL, Penton Building, Cleveland 13, Ohio.

MANUFACTURING ENGINEER
Twenty-five years experience in manufacturing of sheet metal stampings, tool-die design and construction. Emphasis on high speed production, progressive and deep draws. Reply Box 175, STEEL, Penton Building, Cleveland 13, Ohio.

BOLT AND NUT SALES EXECUTIVE with an excellent acquaintance with the larger Distributor and Consumer buyers of Cap Screws, Bolts and Nuts, wishes to represent manufacturer on a commission basis in Kentucky, Illinois, Ohio and Indiana. Reply Box 176, STEEL, Penton Building, Cleveland 13, Ohio.

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New Haven, Conn.
Makers of H & G Die Heads

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DROP-OFFS — WASTERS
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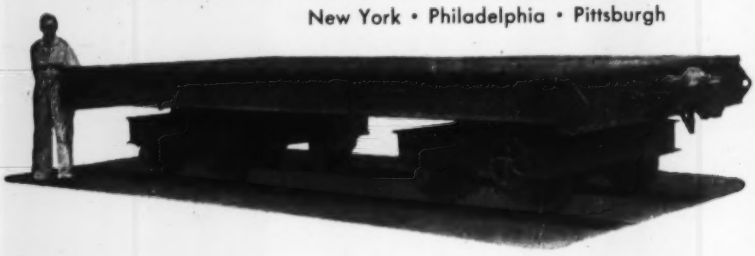


"BEST $1286 WE EVER SPENT!"

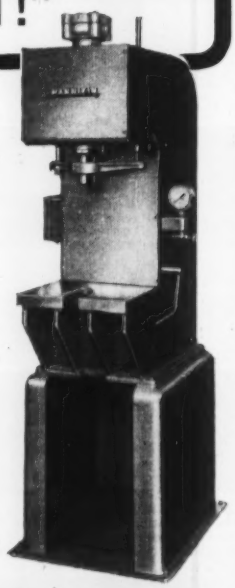
That's the price of this 5-Ton HANNIFIN Press*

A lot of production men have made such comments about this versatile little hydraulic press.

They like the way you can adjust it to the exact force you need for each job, all the way from 1 ton to 5 tons. The backstroke is adjustable, too, so the ram just clears the work on any job. Fast-acting controls. Prompt delivery from stock.

WRITE. Complete information and prices on the Hannifin line of 1- to 10-ton Hydraulic Presses will be sent on request.

*Price complete with motor and starter F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



HANNIFIN

Hannifin Corporation, 523 S. Wolf Road, Des Plaines, Illinois

tension, sec. 36-D, Lehigh county, Pa., bids Jan. 5.

855 tons, seven state bridges, Greenwich-Killingly expressway, Westbrook-Old Saybrook, Conn.; L. G. DeFalice & Sons, New Haven, low, general contract, also 485 tons, reinforcing bars.

800 tons, Cousins Island bridge, Yarmouth, Me.; bids Dec. 29, Augusta, Me.; also 17,800 linear feet steel H-beam piles.

620 tons, four single-span rolled beam bridges, Greenwich-Killingly expressway, Norwalk, Conn.; Paul Bacco Co., Stamford, Conn., low, general contract; also 345 tons, reinforcing bars.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2940 tons, bridge and approaches, Croaton Sound, Dare county, North Carolina, to Virginia Steel Co., Richmond, Va.; T. A. Loving Co., Inc., Goldsboro, N. C., general contractor.

800 tons, Bureau of Reclamation, Naylor siphon project, Columbia Basin, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

5100 tons, The Dalles powerhouse; bids in to U. S. Engineer, Portland, Oreg., Dec. 15.

1000 tons, expansion of Seattle's Gorge dam, Skagit project; general contract to Merritt-Chapman & Scott and Savin Corp., New York, joint low bid of $15,177,166.

PLATES . . .

PLATES PENDING

1500 tons, 70 vertical steel tanks, 10,000-barrel capacity each, f.o.b. cars point of origin, bid to Corps of Engineers, Philadelphia; Moloney-Crawford Tank & Mfg. Co., Tulsa, Okla., low.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago, Milwaukee, St. Paul & Pacific, 74 diesel locomotive units. List comprises twelve 1750-hp road switchers, nine 1600-hp all-purpose units and fifty-three 1200-hp switchers.

Illinois Central, seventy 1750-hp general purpose locomotives to Electro-Motive Division, General Motors Corp.

Southern Pacific, 163 diesel locomotive units to be built by the Electro-Motive Division, General Motors Corp., La Grange, Ill., the American Locomotive Co., New York, and General Electric Co., Schenectady, N. Y.

Virginian railway, 18 diesel road switching engines to Fairbanks Morse Co., Chicago.

RAILROAD CARS PLACED

Oliver Iron Mining Division, U. S. Steel Corp., thirty 40 cu yd, 100-ton dual side, pivot drop door, automatic dump cars, to Baldwin-Lima-Hamilton Corp., Philadelphia.

Ferroalloys . . .

(*Concluded from page* 129)

announced by Electro Metallurgical Co., division of Union Carbide & Carbon Corp., New York. Prices on carload quantities packed in bags or on pallets and less-than-carload quantities remain unchanged. In effect, this sets a premium of $4 a net ton on palletized shipments.

Also effective Jan. 1, most other alloys which have been packed in box pallets without extra charge will carry a premium when so palletized. The premiums will be $4, $5, or $6 per net ton, depending on the density of the material.

The exothermic chromium and vanadium alloys will continue to be palletized without extra charge.

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PANGBORN BLASTS
by don herold

COST-CUTTING STORY OF THE PANGBORN BLAST CLEANING MACHINE

Pangborn Blast Cleaning Machine —available in six types, stationary or portable—delivers efficient, low-cost maintenance in any plant. $1880 up.

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USE MONORAIL CRANES

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These are just a few reasons why American MonoRail Cranes are gaining in popularity and are being installed in increasing numbers of plants the country over. Call in your American MonoRail representative and have him tell you all the advantages of MonoRail Cranes such as—ease of handling—smooth travel—strength—safety interlocks—power operation and **interlocking carrier service between and beyond the craneways.** Consultation in connection with any handling problem is available without obligation.

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AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

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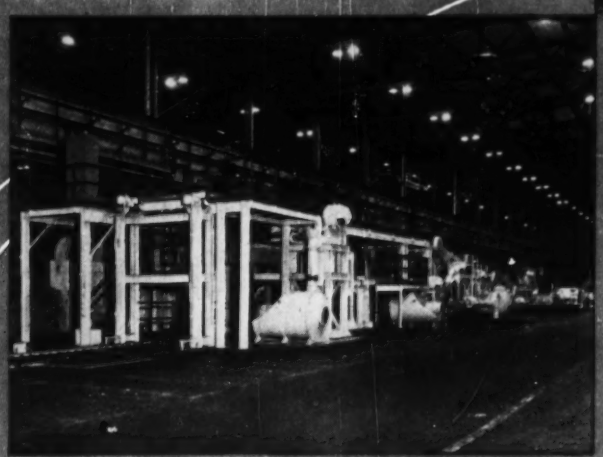
Aetna-Standard designers and builders of production machinery

Flat Rolled Equipment

AT FAIRLESS WORKS...



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For the Tin Mill Division, Aetna furnished a complete Hot Dip Tinning House with all auxiliaries; a side trimming and shearing line; a side trimming and recoiling line; and the classifying equipment for the electrolytic tinning line.

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Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

GOOD EQUIPMENT BRINGS DOWN PRODUCTION COSTS

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Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.
M. Centelivi, Inc., New York, N. Y. — Mexico, Central and South America.
Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.
Deutag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.
Compagnie Italiana Forme Acciaio, Milano, Italy — Italy.
Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.
Hale & Kellgren, Inc., Akron, Ohio — Representatives for the Rubber Industry.
Standard Engineering Company, Ellwood City, Pa.
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Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries

New slabbing mill gains 50% in roll neck strength

with TIMKEN® Balanced Proportion Bearings

THIS 2-high blooming mill, built by United Engineering and Foundry Company, is part of Pittsburgh Steel's $65 million "Program of Progress". To help make sure steel is rolled at the lowest possible cost-per-ton, Timken® balanced proportion bearings are used on the roll necks.

The balanced proportion design of Timken bearings provides a maximum amount of capacity in a given space. Larger diameter roll necks are made possible with no increase in bearing O.D. Load ratings are increased up to 40%, roll neck strength 50 to 60%!

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Higher rolling speeds are possible with Timken bearings because they operate freely, practically without friction. Wear is kept to a minimum, long life is assured. Timken bearings are designed to roll true and precision manufactured to live up to their design. We even make our own steel to *insure* quality control. We're the only U. S. bearing manufacturer that does.

Next time, be sure to specify Timken balanced proportion roll neck bearings. For full details, consult our roll neck specialists. Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

UNITED ENGINEERING AND FOUNDRY COMPANY assures long life, less friction by mounting on the roll necks of this mill at Pittsburgh Steel's plant Timken balanced proportion bearings. Typical roll neck application is shown above.

MAGNIFYING GLASS INSPECTION OF EVERY ROLLER!

Every one of the over one billion Timken bearing rollers produced every year is inspected with powerful magnifying glasses to detect surface flaws. It's just one example of how the Timken Company insures uniform high quality.

TIMKEN

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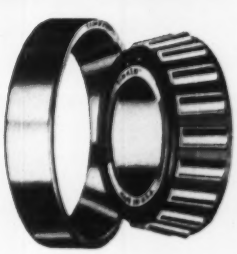
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